New Frontiers

A Report from the Saint Louis University Provost’s Science and Engineering Task Force, with Recommendations, May 2018
At SLU, frontiers are all around us.

Jesuits have always worked at the frontiers. As a Jesuit Catholic university, SLU strives to keep that spirit of exploration alive in contemporary places: in the conformation of a molecule, in the ingenuity of invention, or in moments of inspired collaboration. Our passion for pushing the limits of what’s possible—in science, mathematics, the arts, and medicine—is what keeps us true to our founders. Are we ready for the new frontier?
SLU already invests in this space.

➔ 382 STEM faculty
In the sciences, engineering, mathematics, and medicine across our north and south campuses

➔ 6 STEM schools and colleges
Offering popular degrees from health science to computer science

➔ A trusted Jesuit Catholic mission
Offering service and social justice in a well-rounded, liberal arts environment.

STEM was defined as the natural and physical sciences, engineering and health sciences, as well as math, computer science and the social sciences.
Students want STEM* majors, but SLU lags behind its peers.

- SLU graduates about half as many STEM majors as peer institutions.
- DFW rates in large STEM courses are 2X-4X above SLU’s average.

*63% of incoming freshman, in 2017, wanted a STEM major, including Health Sciences. Source: SLU Internal Data.
A study of Carnegie-2 institutions who advanced to tier-1 status shows that SLU’s RESEARCH EXPENDITURES ARE LOW, but that top-tier advancement is within our reach.

The University of North Texas faculty averaged $57K in research per faculty to move to R1 status in 2015. SLU’s research dollars are $36K per faculty (Source: SLU VP for Research).
What people are saying

- Bring units together physically, or at least remove the physical fragmentation on campus. Knock down institutional silos.
  
STEM Faculty feedback

- There are no networking events on industry. It would be nice to have a STEM initiative geared towards internships and positions.
  
Student feedback

- Recruiting diverse faculty means changing the campus culture, not just in STEM fields but in the humanities and business, too.
  
Non-STEM faculty feedback

Quotations adapted from 15 listening sessions and data-collection from stakeholders in departments crossing Arts and Sciences, Nursing, Health Sciences, Engineering, and the School of Medicine.
What can SLU look like in 5 years?

➔ The pre-eminent Jesuit STEM university in the country
➔ 20% more faculty, 10% more faculty diversity
➔ 3x more minority and underrepresented STEM grads
➔ 2x as many STEM grads
➔ SLU is a Carnegie 1 research institution
Where should we go next?

Five recommendations based on our study and data analysis
1. Recognize and articulate STEM’s importance to SLU's 21st century mission.

2. Establish a structure and campus identity for STEM.

3. Boost STEM-specific IT infrastructure and support.


5. Prioritize STEM faculty development and diversity.
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- Boldly communicate the value of the sciences, engineering, and health sciences to the SLU mission.
- Reform the university core curriculum to provide flexibility within STEM majors.
- Aggressively market STEM programs as vocations for serving others.
- Incentivize and reward collaboration among disciplines and across the institution.
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2. **Establish a structure and campus identity for STEM.**

2.A. Conduct **FORMAL ANALYSIS** to evaluate the implications, financial and other, for the following options:

- A standalone STEM college; *or*
- Restructure the College of Arts and Sciences to provide separate leadership over the physical sciences, social sciences, and humanities; *or*
- A STEM institute that spans both campuses, has leadership, centralized resources, a web presence, and a budget.
2. Establish a structure and campus identity for STEM.

2.B. Change the BUDGET MODEL.

- STEM structure needs leadership positions and a budget.
- Provide additional resources to programs growing in enrollment and/or research productivity.
- Push resources to department and faculty level, incentivizing faculty.
- Establish capital budget for research and core facilities, overseen by the campus research councils, such as SERC.
2. Establish a structure and campus identity for STEM.

2.C. Strengthen STEM STORYTELLING.

- Establish a social media presence for STEM at SLU.
- Design websites describing outreach, highlighting STEM resources, and focusing on STEM faculty that bridge departments and programs.
- Allow communications about academic programs to be handled by Academic Affairs.
2. Establish a structure and campus identity for STEM.

2.D. Focus on DEVELOPMENT.

- STEM faculty are underutilized in terms of outreach to alumni and industry for potential donations.
- Promote STEM-focused development activities.
- Foster student and alumni connection to their department and major in addition to SLU.
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3.A. Support **RESEARCH AGENDAS.**

- Create a research computing support center for data analysis and research across STEM and humanities fields.
- Invest in core scientific equipment facilities.
3. **Boost STEM-specific IT infrastructure and support.**

3.B. Enhance **TEACHING & COLLABORATION**

- Update classrooms and teaching labs.
- Create an intranet for securely storing and exchanging information.
- Make video conferencing simple and reliable between campuses.
4. **Strengthen STEM teaching and learning.**

4.A. Improve **STUDENT SUPPORT.**

- Bring graduate administration and oversight back to a centralized Graduate College.
- Promote networking and career opportunities.
- Engage undergraduate STEM students in validated peer-mentoring programs, such as the Learning Assistant model, with demonstrated benefits for retention.

4.B. Implement CURRICULUM REFORMS.

- Establish undergraduate core curriculum to provide flexibility and create opportunities for interdisciplinary courses.
- Develop programs and curricula that create multiple entry (or exit) pathways removing barriers to graduation.
- Reorganize academic support for STEM students, including advising and tutoring.
4. **Strengthen STEM teaching and learning.**

4.C. Invest in **STEM-STUDENT EXCELLENCE.**

- Allocate financial resources dedicated to bolster recruitment, support and success of students from under-represented groups in STEM.
- Support evidence-based teaching practices in STEM classrooms and laboratories.
5. Prioritize STEM faculty development and diversity.
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5.A. Foster work-life balance and enhance **PRODUCTIVITY**.

- Provide affordable daycare.
- Improve family-friendly policies.
- Realign workload expectations to meet SLU’s goals for research growth.
- Restructure sabbaticals to be more flexible.
5. Prioritize STEM faculty development and diversity.

5.B. Improve TEACHING AND MENTORING.

- Incentivize development for professors and graduate students in inclusive teaching and mentoring skills.
- Appoint a dedicated STEM instructional design expert in the Reinert Teaching Center.
- Provide technology, like data dashboards, to track student preparation and student success.
5. Prioritize STEM faculty development and diversity.

5.C. REWARD OUTREACH.

- Update rank and tenure policies to reward outreach, perhaps by considering levels of “impact.”
- Recognize outreach as part of workload allocation.
- Encourage engagement with national conversations regarding best practices.
- Coordinate and fund STEM undergraduate research efforts.
At SLU, we are ready for the new frontiers. Come explore with us.
# The Provost's Science and Engineering Task Force, 2017–18

**Task Force Co-Chairs**

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