



CENTER FOR MATHEMATICS, SCIENCE, AND TECHNOLOGY

Illinois State University

FY 20 Planning Document

I. Major Objectives for FY20

Describe the unit's most important objectives for FY20. Outline how these support the mission/goals of the Unit/Department/School, College and Educating Illinois.

The Center for Mathematics, Science, and Technology's (CeMaST) three goals are aligned with Illinois State University's strategic plan, Educate • Connect • Elevate: Illinois State – The Strategic Plan for Illinois' First Public University 2018-2023. The ISU campus community is committed to the pursuit of learning and scholarship, individualized attention, diversity and inclusion, respect, collaboration, integrity, and civic engagement. CeMaST contributes to these core values by pursuing and supporting scholarship in science, technology, engineering, and mathematics (STEM) education for all students. In addition, CeMaST seeks to build on its stellar record of quality achievements in meeting the demand for leadership in curriculum, service, and research related to the integration of mathematics, science, and technology in education.

Goal 1. Stimulate and support activities and research on teaching and learning that aligns with campus, state, and national STEM priorities.

CeMaST pursues and supports the development of funded activities and research that promote the teaching and learning of science, technology, engineering, and mathematics. In addition, CeMaST strives to help shape campus STEM priorities by promoting the state and national STEM agenda to further educational innovation and research. This goal aligns with Educate • Connect • Elevate: Illinois State – The Strategic Plan for Illinois' First Public University 2018-2023 Strategic Direction II: Foster Innovation

B) Support advancement of research, creative works, and knowledge generation

- 1. Increase grant-writing activities and administrative support for scholarship*
- 2. Enhance cross-disciplinary research and creative activities*
- 3. Accelerate development and marketing of mission-consistent intellectual property where promising*

C) Enhance organizational infrastructure to support innovation and collaboration

- 2. Further integrate curricular and co-curricular programs that prepare students for success*

Goal 2. Provide leadership to and foster cross-disciplinary collaborative STEM activities and research on teaching and learning.

CeMaST strives to support connections between disciplines on campus as they pursue STEM activities and research. In addition, CeMaST fosters connections between all educational levels from K-12 through graduate school and between academia, industry, and professional societies. This goal aligns with Educate

• Connect • Elevate: Illinois State – The Strategic Plan for Illinois’ First Public University 2018-2023
Strategic Direction IV. Enrich Engagement

- A) *Foster partnerships offering collaborative and mutually beneficial opportunities*
 - 1. *Increase opportunities for alumni, community members, and other partners to create enduring connections that promote knowledge and resource sharing*
 - 2. *Facilitate new partnerships with individuals, businesses, governmental entities, and organizations*
 - 3. *Sustain and grow existing relationships with external stakeholders*
- B) *Involve more faculty, staff, and students in outreach, engagement, and research opportunities locally, regionally, and globally*
 - 1. *Create awareness of opportunities for students to engage in research*
 - 2. *Increase the number and quality of opportunities that engage students in research with faculty*
 - 3. *Recognize, promote, and encourage civic engagement and service learning*
 - 4. *Enhance the ability of members of the University community to engage with each other, internal and external resources, and university partners*
- C) *Deepen student engagement in activities that prepare them for lifelong learning and success*
 - 1. *Support efforts to assess student career outcomes and placement in graduate and professional school*
 - 2. *Integrate career development and readiness opportunities throughout the collegiate career*
 - 3. *Expand and promote opportunities for engagement in professional development*

Goal 3: Direct efforts to increase the diversity of STEM communities through innovative programming, partnerships, and outreach.

CeMaST has a long history of pursuing projects that encourage and assist individuals within underrepresented groups in attaining excellence in STEM fields. CeMaST is committed to continuing these efforts. This goal aligns with Educate • Connect • Elevate: Illinois State – The Strategic Plan for Illinois’ First Public University 2018-2023 Strategic Direction III. Nurture Diversity and Inclusion

- A) *Enhance diversity of faculty, staff, and student populations across the inclusion spectrum*
 - 1. *Provide access to, and increase awareness of, resources for the recruitment of diverse faculty, staff, and students*
 - 2. *Increase and promote practices that aid in the retention of diverse faculty, staff, and students that include individuals from all backgrounds*
- B) *Invigorate the campus community by providing a welcoming and inclusive environment*
 - 1. *Provide additional professional development toward cultural competency and inclusion*
 - 2. *Create and invest in spaces that value and capitalize on diversity*
 - 3. *Increase campus and community awareness of achievements and initiatives that promote diversity and inclusion*
 - 4. *Infuse diverse perspectives into the curriculum, co-curriculum, and other programs and initiatives*

Program Objectives:

Objective B.1. Maintain the following activities:

CeMaST activities for FY20 continue to focus on three main areas which all cut across the three major CeMaST goals: Outreach, Integrated K12 and undergraduate STEM education, and ISU faculty and staff STEM initiatives.

Outreach is an attempt to raise the profile of CeMaST as an important entity within Illinois State University that in turn is a major regional, national and international STEM active institution. (Aligns with Goals 1 & 2 with some Goal 3)

- Hosting the 19th annual ISU High School Research Symposium, organizing the 10th Illinois Summer Research Academy for high school students, supporting World Wide Day of Play and other community outreach events and workshops.
- Developing and facilitating new outreach activities and programs for the Children's Discovery Museum (Normal, Illinois) and the Challenger Learning Center.
- Developing new regional, national, and international programs of professional development in STEM originating at ISU.
- Supporting existing and developing new efforts aimed at increasing the diversity of STEM communities.

Integrating K12 and undergraduate STEM education is aimed at helping drive the national discussion towards embracing the role of integrated education in K12 schools. CeMaST recognizes that modern problems are interdisciplinary and advocates for integrated solutions. Integrating STEM education in K12 schools is one way of achieving integrated solutions. (Aligns with Goals 1 & 2 with some Goal 3)

- Supporting Associate Director Dr. George Rutherford to lead this effort. This includes continued work on developing a Campus/Community MakerSpace, developing stronger Town/Gown STEM relationships, continuing to support and develop the Celebrating High School Innovators program, supporting the Innovation Consulting Community to encourage students and faculty to work on the real problems of real people.
- Retaining Research Associate Dr. Brad Christensen (100% FTE) to conduct research and develop new integrated STEM curricula, organizing professional development and building new relationships with the publisher of the Creative Core Curriculum and exploring new models of advertising and selling the IMaST curriculum. This includes CeMaST staff conducting professional development for STEM teachers across Illinois, across the nation and internationally.
- Retaining one other Research Associate (Matthew Hagaman) to support a variety of research and evaluation efforts. (50% FTE)
- Retaining one other Project and Conference Coordinator (Olesya Courier) to support a variety of project and conference efforts. (100% FTE)
- Supporting existing and developing new efforts aimed at increasing the diversity of STEM communities.

ISU faculty and staff STEM initiatives aims to support those faculty and staff that are engaged in STEM in meeting their own career goals and helping them to have a larger impact. This involves using CeMaST reputation to connect faculty and staff to others across the state and region to develop research projects,

professional development programs, funded grant work, diversity initiatives, interdisciplinary programs that are larger and more effective than the faculty and staff might have originally conceived.

- Supporting Associate Director Drs. Tony Lorschach and Jeff Barrett to lead this effort. This includes continued support of the STEM education faculty consortium, continued work with local Regional Offices of Education. It also includes developing new opportunities in the same way that a MakerSpace, CHSI, and ICC have been promoted above.
- Supporting existing and developing new efforts aimed at increasing the diversity of STEM communities.

Objective B.2. Sponsored Research and Projects

- Write new proposals with faculty at ISU and across Illinois.
- Maintain and complete currently-funded grant projects.

Objective B.3. Journals Project

- Continue to support the Journal of Technology Education, the Journal of STEM Teacher Education, and Obsidian.

Objective B.4. Research and Publications

- Continue to conduct original research and present and publish the results.

Operational Objectives

Objective C.1 Assessment Plan

- Continue implement the CeMaST Assessment Plan developed as part of the Center Review Process.
- Ensure smooth CeMaST Personnel transitions to a new Director (Dr. Rebekka Darner)

Objective C. 2 Revenue Stream

- Diversify our revenue streams by marketing existing curriculum, modifying existing curriculum, and writing new curriculum; we hope to generate revenue to support soft money positions.

Objective C. 3 Diversify CeMaST Influence

- Increase in submissions for major external funding by CeMaST as a unit.
- Promotion of CeMaST through national exposure at meetings, conferences, federal agencies, advisory boards, program adoption and professional development.
- Increase in number of individuals (from national, state, and ISU campus) seeking out CeMaST to help them with grant writing, coordination, and evaluation.

- Continued coordination, development, and participation with ongoing CeMaST and campus funding.
- Develop innovative integrated STEM projects modeled after previous successes.

II. Permanent Funding Requests

Any initiative that would require permanent funding, currently not a source of funds available through the Office of the Provost, should be outlined in this section. A detailed explanation of the need and budget rationale should be provided. Requests for permanent funds should not be included in the Provost Enhancement Requests.

Program Enhancement Requests: Operating Funds

None.

Personnel Requests: Faculty, Staff, Graduate Assistants program growth

None.

I. Strategic Budgeted Carryover (SBC) Requests ONLY (PERS 937 spreadsheet)

List, in priority order, SBC requests in the **PERS 937 – SBC Only tab**. It is recommended you attend the Strategic Budgeted Carryover training and review the SBC documents before completing the spreadsheet. Access and save the PERS 937 spreadsheet to the *Budget Docs Drive: FINAL Folder*.

none

II. Provost Enhancement Requests and Strategic Budgeted Carryover (PERS 937 spreadsheet)

List, in priority order, PE & PE + Strategic Budgeted Carryover in the **PERS 937 – PE & PE + SBC tab**.

Outreach Events

For each of the past seven years we have spent approximately \$2500 on two outreach events.

1. Illinois Summer Research Academy (ISRA)

2013



2017



ISRA (<http://cemast.illinoisstate.edu/students/high-school/summer-academy/>) is entering its ninth year as a one-week summer research experience for high school sophomores and juniors. The goal is to bring excellent STEM students to campus before they have made their college attendance decision and influence them into choosing ISU. Over the past several years we have had 60-80 students pay \$500 each for the week. With each year both the interest by ISU faculty members in mentoring the high school students and the number of high student applications has grown. CeMaST has provided about \$2000 extra to cover the cost of supervision during the week, advertising, research expenses, and scholarships. **Participating ISU departments and programs include Mathematics, Chemistry, Biological Sciences, Physics, Arts Technology, Geology-Geography, Communications Sciences and Disorders, Information Technology, Psychology, and Criminal Justice.** For some students we have been able to offer further need-based scholarships beyond this subsidy. **Having the Provost's support would allow us to provide scholarships to up to 8 more students.**

FY19 Request: \$2,000: We received \$1000 from the Provost Enhancement Fund. This event will take place in June of 2020, and we anticipate similar success to all our previous years.

We again request \$2000 for FY20 to be spent in June 2020.

FY20 Request: \$2,000:

2. High School Research Symposium (HSRS)



HSRS Poster set-up in the Brown Ballroom



Participants in the ISU High School Research Symposium

CeMaST has organized the ISU HSRS (<http://cemast.illinoisstate.edu/students/high-school/research/index.shtml>) for the past seven years and we are well-established as an excellent event for outstanding high school research students to share their work. We have grown to about 250 students from across central and northern Illinois and Chicago attending each year. CeMaST has been supporting HSRS with about \$1500 of variance money for the past eight years. The goal is to bring excellent STEM students to campus before they have made their college attendance decision and influence them into choosing ISU. **Participating ISU departments and programs include Mathematics, Chemistry, Biological Sciences, Physics, LSAMP, Robert Noyce Teacher Scholarship awardees, Geology-Geography, and Psychology.** However, as school budgets have become tighter, teachers have a more difficult time arranging buses to bring their students to the event. **Having the Provost's support for student transportation and facilities costs would allow up to 100 more students to attend.**

FY19 Request: \$1,000: We received \$1000 from the Provost Enhancement Fund. This event will take place in April of 2019, and we anticipate similar success to all our previous years.

We again request \$1000 for FY20 to be spent in April 2020.

FY20 Request: \$1,000:

III. Personnel Requests: Tenure Track Faculty-NEW (PERS 936a spreadsheet)

Based on an assessment of current and projected needs, provide your prioritized requests for tenure track faculty using the PERS 936a forms. It should be noted that all Tenure Track requests should be based on a 9-month contract as limited by AIF. Access and save the PERS 936 spreadsheet to the *Budget Docs Drive: FINAL Folder*.

None

IV. Personnel Requests: Tenure Track Faculty- Non-reappointment or tenure-denial/death (PERS 936b spreadsheet)

None

V. Facilities Requests

Academic Construction Project Initiation Forms should be submitted through the appropriate Dean to the Provost by December 15th. All Academic Construction Projects that request Provost Funds will be considered as a part of the Provost Enhancement process and **should** be included with the PERS 937 requests.

We are housed in the Campus Religious Center where we have five offices and share two meeting spaces. We are currently using all our allocated space and do not foresee needing additional space in the near future. We have used various classrooms and space on campus for our outreach activities. If however, we continue to successfully obtain external grant funding, we may have fluctuating space needs. There are times during the year particularly in the summer, when we could use 3000-4000 square feet of general construction space to build and refurbish grant project exhibits, and other large scale curriculum supports.