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Overview of Changes to the S-STEM and IUSE Programs

The National Science Foundation (NSF) Division of Undergraduate Education (DUE) Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM, NSF 20-526) [5] and Improving Undergraduate STEM Education: Education and Human Resources (IUSE: EHR, NSF 19-601) [4] programs are frequent funding targets for the computer science education (CSEd) community. These programs were discussed in the context of evaluation in an earlier column [1]. NSF programs evolve over time to respond to community needs and changes at the Foundation. The purpose of this column is to bring recent changes to S-STEM and IUSE and other changes at NSF that impact CSEd to the attention of the community.

S-STEM

S-STEM provides funds for institutions of higher education (including both two- and four-year schools) to award scholarships to low-income, academically talented students with demonstrated unmet financial need who are pursuing a graduate or undergraduate degree in an S-STEM eligible discipline. At least 60% of the total amount requested must be devoted to scholarships. Institutions use the balance of the budget to establish curricular and co-curricular activities and to investigate the effects these activities have on retention, student success, academic/career pathways, degree attainment, and entry into the workforce or graduate programs. These activities must include faculty mentoring and a program that develops and sustains the formation of cohorts. The award can also be used to support inter-

ventions that address attrition points in the curriculum, summer and/or academic-year undergraduate research experiences, travel to professional society meetings, and similar activities. The proposing institution is required to define “low income” and “academic talent” and report its effective cost of attendance. In addition, all projects are expected to contribute to the STEM education knowledge base.

The new S-STEM solicitation includes several changes and clarifications. Four significant ones are described below.

Degree eligibility. Not all disciplines that may be considered STEM (science, technology, engineering, and math) can be supported by S-STEM. The new solicitation clarifies the degrees that are S-STEM eligible. For example, and of likely interest to the CSEd community, degrees in computer science, software engineering, and cybersecurity are generally supported. On the other hand, degrees that lead to a Bachelor of Arts or Bachelor of Science in Business Administration (BABA/BSBA) are ineligible, even if the focus of study is technology related. For example, a degree that focuses on information technology

but leads to a BSBA would not be able to receive funding. A PI wishing to verify that her/his program(s) are S-STEM eligible should contact a cognizant NSF program officer (see below) before submission.

Halftime status. S-STEM no longer requires that students be enrolled fulltime to be eligible to receive a scholarship. Students now only need to be at least half-time, as defined by their institution. This change is not retroactive—projects funded under a previous solicitation must follow the rules of that solicitation.

Required Supplementary Document. The S-STEM solicitation now requires that a proposal include tables in a supplementary document that provide the anticipated 1) number of unique scholars supported; 2) amount of each scholarship; and 3) number of years of scholarship support per scholar. A table containing the names of the degrees that will be awarded should also be included in the document. Although this information was required previously, the format of presentation is new.

Supplemental funding. The new solicitation explicitly states that supplemental funding of S-STEM projects can



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be requested. Pls interested in submitting a request should contact their managing program officer before submission.

IUSE is a core NSF STEM education program that seeks to promote novel, creative, and transformative approaches to generating and using new knowledge about STEM teaching and learning to improve STEM education for undergraduate students. IUSE is explicitly not a scholarship program. Instead, the entire budget of an IUSE project is used to support the development of teaching practices and curricular innovations that improve undergraduate STEM education and/or enable institutions of higher education to implement and sustain highly effective STEM teaching and learning. All IUSE: EHR projects are expected to increase the knowledge base on effective STEM education; this may be achieved by posing one or more research questions that will be answered during the study or through the evaluation of project activities, impacts, or outcomes.

IUSE: EHR

The new IUSE: EHR solicitation includes the following three significant changes.

Replication studies. The new solicitation encourages the submission of replication studies. In a replication project, a previous study is repeated with systematic variations, on a different demographic, or at a different type of institution. The goal of such an effort is to deepen the knowledge base on the effectiveness and transferability of previous findings.

Funding categories. Although the IUSE: EHR program continues to have two distinct tracks, Engaged Student Learning (ESL) and Institution and Community Transformation (ICT), both tracks are now subdivided into three, non-overlapping levels with new names. Briefly, ESL projects involve the development, testing, and use of teaching practices and curricular innovations that will engage students and improve learning, persistence, and retention in STEM. ICT projects deal with the transformation of colleges and universities by implementing and sustaining highly effective STEM teaching and learning; they are expected to include one or more theories of change to guide the proposed work.

ESL now consists of Levels 1, 2, and 3 with budgets of up to \$300,000, \$600,000,

and \$2 million, respectively. Levels 1 and 2 have maximum durations of three years; Level 3 projects can last up to five years but will likely involve more than one institution. ICT is divided into a capacity-building level and Levels 1 and 2. The maximum durations and budgets of the three levels are two, three, and five years and \$150,000, \$300,000, and \$2 million, respectively; ICT Level 2 proposals that involve multiple institutions or are from research centers studying phenomena of broad potential impact can have budgets of up to \$3 million. In all cases, the scope and scale of a proposed project should be consistent with the requested level of funding.

Submission Deadlines. IUSE: EHR has moved away from the open window model for submission. All three levels of both tracks now have submission deadlines: projects requesting funding up to \$300,000 can be submitted in either February or August; projects requesting funding over \$300,000 have a December submission deadline.

NSF Changes and Concluding Remarks

Just as solicitations change, personnel change. The Division of Undergraduate Education has bid farewell to Stephanie August, whose term [2] ended in February. Dr. August has returned to her home institution, Loyola Marymount University (Los Angeles, CA). She looks forward to seeing members of the CSEd community at conferences and on review panels. At the same time, the Division welcomes a returning program officer, Paul Tymann, to the computer science team. This leaves the complement of DUE program officers with computer science expertise at three: Paul Tymann, Mark Pauley, and Sami Rollins. They are the points of contact for those in the community interested in submitting proposals to Division programs [3]. Their contact information can be found on the IUSE program page [4]. As mentioned in previous columns and discussed on the NSF website [6], NSF is always looking for temporary program officers, individuals who are eager to serve the community and view the nation from a strategic perspective. If you are interested in exploring this opportunity in the future, please contact Mark, Sami, or Paul.

The above provides an overview of the changes to the S-STEM and IUSE: EHR solicitations. Those wishing to submit a proposal to one or both of these programs should carefully read the appropriate solicitation before submitting. Any questions should be addressed to Sami, Paul, or Mark. ❖

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