JHU Gateway Science Initiative
2013 Request for Proposals

I. Overview

The JHU Gateway Science Initiative (GSI), begun by the Provost in 2011, seeks to enhance the quality of teaching and learning across the university in the courses that serve as entry points or provide critical introductory material for undergraduate and graduate study in the natural, behavioral, and medical sciences, in engineering, and in other fields where some basic scientific knowledge is a necessary component.

As part of the initial GSI program, the President and Provost provided funding for a set of pilot projects whose objectives were to both improve the effectiveness of current gateway science courses and to provide a means to study and implement potentially larger scale innovations in pedagogy, course and program design, and instructional methodologies. The early results from many of the 11 round one pilot projects were discussed at the recent GSI Second Annual Symposium on Excellence in Teaching and Learning, attended by nearly 300 faculty, students and staff. That symposium represents the summit of the “exploration phase” of the GSI.

To begin the GSI “transformation phase”, this document announces a new request for proposals (RFP) that will build upon what was learned from and expand the scope of the original GSI program. This new RFP calls for proposals to transform Gateway Science teaching and learning methods, courses, curricula, and programs to provide the best possible education for JHU students.

- **Targeted courses and subject areas.** Proposals are solicited that focus on natural sciences, mathematics, or engineering and/or have a quantitative focus or strong quantitative component in either undergraduate or graduate education.
- **Budget and project period.** The total project period for an application submitted in response to this RFP may not exceed 2 years. It is anticipated that several smaller awards with funding levels ~$50,000 will be made, in addition to larger awards up to a maximum of $500,000. Matching funds or other in-kind contributions, including faculty release time, from participating departments or divisions are encouraged.
- **Funds available.** The JHU President and Provost have committed approximately $800,000 to fund projects submitted in response to this RFP.
- **Proposal submission deadline: Friday, June 14, 2013.**
- **Earliest anticipated start dates for awards:** August 1, 2013.

II. Funding Opportunity Description

II.A. Background and Program Goals

While Gateway science courses (GSCs) potentially cover a wide range of disciplines, this RFP will continue the focus established for the first round of projects, namely, courses in the natural sciences, mathematics, or engineering and/or that have a quantitative focus or strong quantitative component (e.g., proposals originating from the Krieger or Whiting Schools should target courses coded as N, Q, or E).
Gateway science courses are defined as courses that establish the necessary foundational knowledge for subsequent, more specialized subject area study and research. While many of these courses are offered in large lecture-theatre formats or massive parallel laboratory sessions, GSCs are defined by their roles in initiating and underpinning programs of study, rather than by their scale. As such, smaller courses could also be considered GSCs if they present information on which an extended further curriculum depends. It is also important to note that GSCs are not restricted to the undergraduate curriculum, but play an important role in graduate education as well.

A great diversity of student goals and learning styles is represented in GSC enrollments. For some students, these courses represent their first immersion in a subject of interest; for others, they are a necessary step on the way to more compelling future studies. Some students are well-served by traditional lecture-style presentations, while others would be better served by a more active, varied form of student engagement in the material. The primary goals for students in GSCs are (1) to master the course content essential for success in higher-level more specialized courses, (2) to develop the skills necessary to facilitate the self-discovery and independent learning techniques necessary for a future career in scholarly research, (3) to begin the process of understanding the interdisciplinary nature of higher learning in the sciences, and (4) to generate excitement about the individual disciplines and their roles in scholarly activity. While the traditional lecture-based format has been shown to achieve these goals in limited cases, an active study of more engaging approaches to learning, in addition to the lecture format or as an alternative to this format, should greatly enhance our ability to achieve these goals for a greater percentage of the GSC enrollment.

The purpose of this second RFP is to continue the process of transforming gateway science education at JHU by garnering bold, creative, culture-changing ideas for transforming GSCs based on sound precedents and accompanied by rigorous assessment plans. The intent is to fund projects that will produce significant increases in the numbers of students engaged in higher level learning activities, including discovery, synthesis, and invention, and higher levels of active participation by a broader representation of the diverse GSC demographics. These goals can be reached through changes in delivery methods, curriculum organization/combination, and imaginative use of resources. New insights into the cognitive processes and motivations of both students and faculty participating in GSCs, and new means to improve faculty-student interactions, would also be valuable. Projects based on a single GSC that can result in widely applicable findings and new resources for other courses and disciplines are particularly welcome.

II.B. Types of proposals solicited

It is envisioned that a wide range of proposals and projects that enhance learning in gateway science courses or point the way forward may be responsive to this RFP. For example, projects may focus on existing courses, develop new courses or programs, enhance or advance pedagogy, or develop new learning resources and strategies that function either inside or outside the classroom. Projects should build on and reinforce
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known best practices in education, including active learning, the encouragement of student-faculty interactions and cooperation among students, and respect for students’ diverse talents and modes of learning.1 Where relevant, projects should specifically engage the body of research related to learning and the science of learning. Proposals that feature components designed to coordinate with or build or improve upon previously funded GSI projects are encouraged. However, such proposals should not merely request funding for continued operations of an existing project.

Examples of possible approaches might include:

- Enhancements or restructuring of traditional large-lecture-based GSCs to incorporate active learning, just-in-time teaching, or other methods that promote student engagement and discovery. This could include improvements to or the addition of laboratory components of these courses, enhancements in the training and effectiveness of graduate teaching assistants or incorporation of undergraduate learning assistants in a variety of contexts.

- Creation of new interdisciplinary courses or programs that adopt integrated approaches to the learning of gateway science material.

- Innovations in instructional technology, particularly those that are adaptable to a range of GSCs, that enhance communication among students and between instructors and students, or that provide multisensory engagement with course concepts.

- Developing approaches to scale up proven concepts to broader adoption.

- Renovation of existing classroom space, or developing new spaces that facilitate new modes of teaching.

- Development of a rigorous analysis relating the effectiveness of instructional approaches and the consequences of class sizes to student learning styles and abilities, with plans to implement the “most effective” combinations in GSCs.

- Reconsideration of the sequence and pace of lecture, discussion, experimentation, practice, and assessment in different GSC subjects, including multiple settings outside the classroom.

- Revision of courses to present recent but widely used scientific techniques as standard, while de-emphasizing methods that have been superseded.

- Development of new courses that address challenges or needs that span multiple programs in either undergraduate or graduate education.

- Development of curriculum units on skills — e.g., MatLab, GIS, R — that can be used by a variety of introductory courses, reducing the need for remedial instruction.

Proposals should consider the variety of student learning styles, and need not confine themselves to learning improvements only in formal course environments. For example, the “PILOT” Peer Led Team Learning project recently initiated by the Whiting School in conjunction with Krieger School math and physics GSCs and the JHU CTY’s

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Cogito project (www.cogito.org) represent innovative learning environments that go beyond traditional face-to-face classroom work with faculty.

Respondents are encouraged to consult with divisional teaching and learning center staff or outside instructional design and pedagogical experts for assistance with concept development, budgeting, and assessment strategies.

While not required, respondents are also encouraged to seek additional funding or other in-kind contributions (faculty release time, staff resources, etc.) from the sponsoring department(s) or division(s).

II.C. Eligibility

Proposals may be submitted by individual faculty, groups of faculty, single departments or multiple departments in any of the JHU divisions. Because of the anticipated impact of these proposals on core teaching missions, the written support of both the chair(s) of the impacted department(s) and the dean(s) of the relevant division(s) is required.

II.D. RFP Timeline

Friday, April 12, 2013: RFP released to JHU community.

Information sessions with members of Gateway Sciences Steering Committee

East Baltimore information meeting
Tuesday, April 30, 2013, 3:00 PM – 4:00 PM
Location: W1030 (The Anna Baetjer Room)
Bloomberg School of Public Health
615 N. Wolfe St

Homewood information meeting
Friday, May 3, 2013, 3:00 PM – 4:00 PM
Location: Mason Hall Auditorium

Friday, June 14, 2013: Proposals due.
Monday, July 15, 2013: Funding decisions announced.
Thursday, Aug. 1, 2013: Earliest start date for funded projects.

III. Application and Submission Information

III.A. Content and form of application

Proposals should be prepared single-spaced with 1-inch margins (minimum font size 11 point), and should conform to the following format:

1. Title and Abstract (limit 1/2 page)
2. Project Description (limit 4 pages)
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The project description should include the following: statement of the problem and goals of the project; significance and potential impact; context for the project in relation to current best practices or other current teaching innovations; summary of preliminary or pilot work underway (if any); plan for implementation; anticipated outcomes; plan for sustainability beyond the timeframe of the project. If a proposal builds on a project funded in the previous GSI cycle, a clear description of how the impact of the previous work would be markedly increased by additional funding, beyond the simple extension of the same activity, is required.

4. Evaluation and Assessment Plan (limit 1 page).
5. References Cited.
6. Budget (limit 1 page).
   This should list the cost of activities and supplies required by the project, and any matching funds, in-kind contributions or other resources that will be devoted to it. Include a brief budget justification.
7. Appendices.
   A. Short biosketches of key participants, emphasizing relevant expertise.
   B. Letters of support from relevant department(s) and dean(s).

III.B. Proposal submission procedure

Proposals should be submitted via email as PDF attachments to Gateway.Sciences@jhu.edu.

Deadline for submission: 5 PM, Friday, June 14, 2013.

IV. Application Review Information

Proposals will be reviewed by the Gateway Science Initiative Faculty Steering Committee.

Review criteria include:

- Potential for transformative impact on student learning. How will the proposed project advance the cause of gateway science teaching at JHU?
- Alignment with best instructional practices in the field, where appropriate.
- Quality and clarity of the assessment plan; measurable goals and outcomes.
- Sustainability of the proposed reforms or innovations.
- Scalability for pilot programs, and/or portability of results to other courses or programs.
- Support from the department(s) responsible for the courses or programs affected, and from the dean(s) of relevant divisions. Note that proposals submitted without the endorsement of the relevant department(s) and dean(s) will not be reviewed.
Evidence of needs assessment and inclusion of the affected constituencies. Many GSCs offered in a given department or division are required courses for students in other departments or divisions. (Notable examples include the basic physics, chemistry, and biology and math courses taught by KSAS departments that are taken by many students from WSE.) Will faculty in the home divisions of the students affected be involved in the project in an appropriate way?

Feasibility with resources requested; appropriateness of scope and cost effectiveness.

V. Funding Restrictions

Funding may be requested to support all activities justified in the budget. This may include, but is not limited to salary support and benefits for faculty, staff or students participating in the project, purchase of materials and supplies, development or acquisition of computational resources, etc. No indirect costs may be charged to these grants.

While proposals are encouraged that follow up on or build on currently funded GSI projects, such proposals may not merely request funds to continue operation of existing projects.

Funding may be requested for periods of up to 2 years. Funding for the second year will be contingent on demonstration of appropriate progress toward the project’s goals.

VI. Award Administration

Award notices will be issued by the JHU Office of the Provost on or shortly after July 15, 2013. The earliest start date for funded awards is August 1, 2013.

VI.A. Reporting

All grant recipients will be required to provide an interim report on progress toward the project’s goals halfway through their funding period. Upon completion of the grant period, recipients will be expected to submit final reports detailing outcomes, successes and failures. This report should include discussion of future opportunities that can build on the outcomes of the funded work.

Grant recipients will be expected to make presentations on their projects at annual Gateway Science symposia at JHU. These symposia are typically held in the January Intersession.

VII. How to Obtain More Information

Potential applicants are encouraged to contact Vice Provost Scott Zeger (szeger@jhu.edu) or the co-chairs of the Gateway Science Initiative Faculty Steering Committee, Bloomberg School of Public Health Prof. Marie Diener-West (mdiener@jhsph.edu) and Krieger School Vice-Dean for Undergraduate Education Prof.
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Steven David (sdavid@jhu.edu) with questions about suitability of potential proposals or about the Gateway Science Initiative.

**Open Meetings:** The GSI Faculty Steering Committee will hold two open meeting to provide potential applicants the opportunity to discuss the RFP and the broader Initiative. These information sessions will be held on the following dates and times:

**East Baltimore**
- **Tuesday, April 30, 2013, 3:00 PM – 4:00 PM**
- **Location:** W1030 (The Anna Baetjer Room)
- **Bloomberg School of Public Health**
- **615 N. Wolfe St**

**Homewood**
- **Friday, May 3, 2013, 3:00 PM – 4:00 PM**
- **Location:** Mason Hall Auditorium

**List of Currently Funded GSI Projects**

Summaries of the projects currently funded by the GSI are available at [http://web.jhu.edu/administration/provost/initiatives/gsi/grants](http://web.jhu.edu/administration/provost/initiatives/gsi/grants). Prospective applicants are encouraged to contact the PIs of the current projects to obtain further information.

**Teaching and Learning Center Resources for Faculty at JHU**

- **WSE and KSAS:** Center for Educational Resources, Candice Dalrymple, Director, cdalrymple@jhu.edu; 410.516.8848
- **BSPH:** Center for Teaching and Learning, Sukon Kanchanaraksa, Director, skanchan@jhsph.edu; 410.223.1851
- **SoN:** Office of Teaching Excellence, Anne Belcher, Director, abelche2@son.jhmi.edu; 410.955.1730
- **SoM:** Institute for Excellence in Education, Joseph Cofrancesco, Jr., Director, joeco@jhmi.edu; 410.955.5515 and/or Harry Goldberg, Assistant Dean and Director of Academic Computing, goldberg@bme.jhu.edu; 410.955.2359
- **SAIS:** Office of Academic Affairs, Nathan Kreps, Manager of Academic Technology, nkreps@jhu.edu; 202.663-5652