

#### § 3405.5

carrying out this responsibility is the competitive Higher Education Challenge Grants Program. A primary goal of the program is to attract and ensure a continual flow of outstanding students into food and agricultural sciences higher education programs and to provide them with an education of the highest quality available anywhere in the world and which reflects the unique needs of the Nation. It is designed to stimulate and enable colleges and universities to provide the quality of education necessary to produce baccalaureate or higher degree level graduates capable of strengthening the Nation's food and agricultural scientific and professional work force. It is intended that projects supported by the program will:

(a) Address a State, regional, national, or international educational need;

(b) Involve a creative or nontraditional approach toward addressing that need which can serve as a model to others;

(c) Encourage and facilitate better working relationships in the university science and education community, as well as between universities and the private sector, to enhance program quality and supplement available resources; and

(d) Result in benefits which will likely transcend the project duration and USDA support.

#### § 3405.5 Matching funds.

Each application must provide for matching support from a non-Federal source. NIFA will cite in the program announcement the required percentage of institutional cost sharing.

#### § 3405.6 Scope of program.

This program supports projects related to strengthening undergraduate or graduate teaching programs as specified in the annual program announcement. Only proposals addressing one or more of the specific targeted need areas(s) identified in the program announcement will be funded. Proposals may focus on any subject matter area(s) in the food and agricultural sciences unless limited by determinations as specified in the annual program announcement. A proposal may

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address a single targeted need area or multiple targeted need areas, and may be focused on a single subject matter area or multiple subject matter areas, in any combination (e.g., curriculum development in horticulture; curriculum development, faculty enhancement, and student experiential learning in animal science; faculty enhancement in food science and agribusiness management; or instruction delivery systems and student experiential learning in plant science, horticulture, and entomology). Targeted need areas will consist of one or more of the following:

(a) *Curricula design and materials development.* (1) The purpose of this initiative is to promote new and improved curricula and materials to increase the quality of, and continuously renew, the Nation's academic programs in the food and agricultural sciences. The overall objective is to stimulate the development and facilitate the use of exemplary education models and materials that incorporate the most recent advances in subject matter, research on teaching and learning theory, and instructional technology. Proposals may emphasize: the development of courses of study, degree programs, and instructional materials; the use of new approaches to the study of traditional subjects; or the introduction of new subjects, or new applications of knowledge, pertaining to the food and agricultural sciences.

(2) Examples include, but are not limited to, curricula and materials that promote:

(i) Raising the level of scholastic achievement of the Nation's graduates in the food and agricultural sciences.

(ii) Addressing the special needs of particular groups of students, such as minorities, gifted and talented, or those with educational backgrounds that warrant enrichment.

(iii) Using alternative instructional strategies or methodologies, including computer-assisted instruction or simulation modeling, media programs that reach large audiences efficiently and effectively, activities that provide hands-on learning experiences, and educational programs that extend learning beyond the classroom.

(iv) Using sound pedagogy, particularly with regard to recent research on

how to motivate students to learn, retain, apply, and transfer knowledge, skills, and competencies.

(v) Building student competencies to integrate and synthesize knowledge from several disciplines.

(b) *Faculty preparation and enhancement for teaching.* (1) The purpose of this initiative is to advance faculty development in the areas of teaching competency, subject matter expertise, or student recruitment and advising skills. Teachers are central to education. They serve as models, motivators, and mentors—the catalysts of the learning process. Moreover, teachers are agents for developing, replicating, and exchanging effective teaching materials and methods. For these reasons, education can be strengthened only when teachers are adequately prepared, highly motivated, and appropriately recognized and rewarded.

(2) Each faculty recipient of support for developmental activities under § 3405.6(b) must be an “eligible participant” as defined in § 3405.2(j) of this part.

(3) Examples of developmental activities include, but are not limited to, those which enable teaching faculty to:

(i) Gain experience with recent developments or innovative technology relevant to their teaching responsibilities.

(ii) Work under the guidance and direction of experts who have substantial expertise in an area related to the developmental goals of the project.

(iii) Work with scientists or professionals in government, industry, or other colleges or universities to learn new applications in a field.

(iv) Obtain personal experience working with new ideas and techniques.

(v) Expand competence with new methods of information delivery, such as computer-assisted or televised instruction.

(vi) Increase understanding of the special needs of non-traditional students or students from groups that are underrepresented in the food and agricultural sciences workforce.

(c) *Instruction delivery systems.* (1) The purpose of this initiative is to encourage the use of alternative methods of delivering instruction to enhance the

quality, effectiveness, and cost efficiency of teaching programs. The importance of this initiative is evidenced by advances in educational research which have substantiated the theory that differences in the learning styles of students often require alternative instructional methodologies. Also, the rising costs of higher education strongly suggest that colleges and universities undertake more efforts of a collaborative nature in order to deliver instruction which maximizes program quality and reduces unnecessary duplication. At the same time, advancements in knowledge and technology continue to introduce new subject matter areas which warrant consideration and implementation of innovative instruction techniques, methodologies, and delivery systems.

(2) Examples include, but are not limited to:

(i) Use of computers.

(ii) Teleconferencing.

(iii) Networking via satellite communications.

(iv) Regionalization of academic programs.

(v) Mobile classrooms and laboratories.

(vi) Individualized learning centers.

(vii) Symposia, forums, regional or national workshops, etc.

(d) *Scientific instrumentation for teaching.* (1) The purpose of this initiative is to provide students in science-oriented courses the necessary experience with suitable, up-to-date equipment in order to involve them in work central to scientific understanding and progress. This program initiative will support the acquisition of instructional laboratory and classroom equipment to assure the achievement and maintenance of outstanding food and agricultural sciences higher education programs. A proposal may request support for acquiring new, state-of-the-art instructional scientific equipment, upgrading existing equipment, or replacing non-functional or clearly obsolete equipment.

(2) Examples include, but are not limited to:

(i) Rental or purchase of modern instruments to improve student learning experiences in courses, laboratories, and field work.

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(ii) Development of new ways of using instrumentation to extend instructional capabilities.

(iii) Establishment of equipment-sharing capability via consortia or centers that develop innovative opportunities, such as mobile laboratories or satellite access to industry or government laboratories.

(e) *Student experiential learning.* (1) The purpose of this initiative is to further the development of student scientific and professional competencies through experiential learning programs which provide students with opportunities to solve complex problems in the context of real-world situations. Effective experiential learning is essential in preparing future graduates to advance knowledge and technology, enhance quality of life, conserve resources, and revitalize the Nation's economic competitiveness. Such experiential learning opportunities are most effective when they serve to advance decision-making and communication skills as well as technological expertise.

(2) Examples include, but are not limited to, projects which:

(i) Provide opportunities for students to participate in research projects, either as a part of an ongoing research project or in a project designed especially for this program.

(ii) Provide opportunities for students to complete apprenticeships, internships, or similar participatory learning experiences.

(iii) Expand and enrich courses which are of a practicum nature.

(iv) Provide career mentoring experiences that link students with outstanding professionals.

(f) *Student recruitment and retention.*

(1) The purpose of this initiative is to strengthen student recruitment and retention programs in order to promote the future strength of the Nation's scientific and professional work force. The Nation's economic competitiveness and quality of life rest upon the availability of a cadre of outstanding research scientists, university faculty, and other professionals in the food and agricultural sciences. A substantial need exists to supplement efforts to attract increased numbers of academically outstanding students to prepare

for careers as food and agricultural scientists and professionals. It is particularly important to augment the racial, ethnic, and gender diversity of the student body in order to promote a robust exchange of ideas and a more effective use of the full breadth of the Nation's intellectual resources.

(2) Each student recipient of monetary support for education costs or developmental purposes under §3405.6(f) must be enrolled at an eligible institution and meet the requirement of an "eligible participant" as defined in §3405.2(j) of this part.

(3) Examples include, but are not limited to:

(i) Special outreach programs for elementary and secondary students as well as parents, counselors, and the general public to broaden awareness of the extensive nature and diversity of career opportunities for graduates in the food and agricultural sciences.

(ii) Special activities and materials to establish more effective linkages with high school science classes.

(iii) Unique or innovative student recruitment activities, materials, and personnel.

(iv) Special retention programs to assure student progression through and completion of an educational program.

(v) Development and dissemination of stimulating career information materials.

(vi) Use of regional or national media to promote food and agricultural sciences higher education.

(vii) Providing financial incentives to enable and encourage students to pursue and complete an undergraduate or graduate degree in an area of the food and agricultural sciences.

(viii) Special recruitment programs to increase the participation of students from non-traditional or under-represented groups in courses of study in the food and agricultural sciences.

### § 3405.7 Joint project proposals.

Applicants are encouraged to submit joint project proposals as defined in §3405.2(m), which address regional or national problems and which will result overall in strengthening higher education in the food and agricultural sciences. The goals of such joint initiatives should include maximizing the