

**Endeavor Science Teaching Certificate Project
Administered by U.S. Satellite Laboratory
Cooperative Agreement
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PROJECT DESCRIPTION

The NASA Endeavor Science Teaching Certificate Project (ESTCP) is a national science teacher certificate program for in-service, pre-service and alternative-route educators designed to deliver professional development through a series of online Short Courses and individualized Action Research plans all of which are based upon NASA content and educational materials.

Within the 5-year grant lifetime, 200+ Endeavor Fellowships will be awarded with potential for additional partnership-sponsored Fellowships. Each Fellow takes five or more graduate courses delivered via an innovative, LIVE (online) format, learns to apply research-based pedagogical strategies and cutting-edge STEM (Science, Technology, Engineering and Mathematics) content to their classroom contexts, shares gained expertise with colleagues and peers, and becomes a member of a special network of like-minded educators across the Nation.

Fellows, in concert with their Endeavor mentor, choose from the selection of online courses those that will be most beneficial to them in improving their knowledge of NASA STEM content and their understanding of pedagogically effective classroom instruction. An Action Research Class and an Individualized Plan, requires Fellows to apply and evaluate their use of instructional best practices and NASA content in their respective classes. Additionally, Fellows may apply for an Endeavor summer internship at a NASA Center.

Endeavor Fellows are awarded a NASA Endeavor Certificate in STEM Education from Teachers College, Columbia University, with whom Endeavor partners and is the affiliation of many of the course instructors. Fifteen (15) graduate credits are awarded from other regionally-accredited partners in higher education.

ESTCP provides workshops for science teacher instructors in colleges of education to assist with incorporation and delivery of NASA content in Methods and Practicum courses for pre-service educators.

PROJECT GOALS

The primary goals of Endeavor are twofold:

1. Contribute to the development of a STEM workforce knowledgeable in NASA STEM content and 'best practices' instructional delivery practices through a national science teacher certificate program.
2. Attract and influence K-12 students to STEM disciplines through engagement in relevant and effective classroom activities presented by educators influenced by the Endeavor project and/or its graduates.

PROJECT BENEFIT TO OUTCOME (1,2, OR 3)

Endeavor contributes to achievement of Outcome 2, specifically

1. Long Duration Professional Development (PD) and by design of the PD,
2. Student involvement in NASA STEM instructional and enrichment activities.

The Endeavor professional development model is designed to create a national cadre of 200+ Endeavor Fellows who demonstrate leadership in use of NASA STEM content within their classrooms and in educator workshops at the district, regional and state levels.

Throughout their individualized PD, Fellows explore how they will incorporate the content and best practices in their respective classes. The required Action Research Plan and Methods in STEM Education course require Fellows to apply and evaluate delivery of the content and instructional methods.

Cohort I Fellows included in-service educators from 16 states. All 40 remain actively involved in progressing toward completion of their Certificates. Five will be awarded the Endeavor Certificate after the 2009 Fall session.

Over 130 applications from 38 states have been received for Cohort 2. November 10, 2009 is the application closing date with 40 Cohort 2 Fellows slated to begin courses in January 2010. Additionally, negotiations with potential partners may be completed within the next few months increasing the total number of 2010 Fellows, this would bring the total number of Endeavor Fellows to 80+. Beginning with the Cohort II Fellows will be required to demonstrate leadership in extending the value of their Fellow experience within their classrooms and with colleagues and peers. A Leadership Distinction will be noted on their certificate.

PROJECT ACCOMPLISHMENTS (CONNECTION BACK TO ANNUAL PERFORMANCE GOALS AND PLANS)

Key accomplishments were made toward achievement of Year One performance goals.

Cohort I – Successful Teacher Recruitment of Targeted Populations

Year 1 of Endeavor has established its credibility as a concept and the responsiveness of applicants and participants. The foundation has been solidly built.

- ESTCP recruited, selected and implemented coursework with 40 Cohort I Fellows, representing 16 states.
- All are in-service educators
- 40% represent urban/rural populations
- 77% represent underrepresented populations
- Cohort II applications in process; selection by December 2009.
- Partnership discussions underway for sponsorship of additional Fellows

Online Course Content Relevant and Inclusive of NASA Mission Directorates

Staff of Teachers College, Columbia University whose graduate work was in science education are instructors for the majority of online courses.

- 17 distinct content courses are inclusive of content from each of the NASA Mission Directorates
- Additional courses are in development stages
- All 40 Fellows remain active in course participation and completion
- Feedback, both anecdotal and formal, suggests the Endeavor courses and experiences will change their instructional delivery of science to include NASA-related STEM materials.

Development of Partnerships with State DOEs and Educational Organizations

Within the first year, Endeavor pro-actively sought to gain recognition of coursework from State Departments of Education in Maine, Virginia and Florida. Each state has been responsive and indicated interest in further discussion. Adams State College is working with Endeavor's accreditation consultant to create a Master's Degree program focused on Endeavor coursework. Dialogue with Teach for America is in process of developing a mutually beneficial partnership.

- Maine DOE accepts all Endeavor courses toward certification in general physical or biological sciences and the Methods for STEM Education course is accepted as meeting the secondary science methods requirement.
- Florida DOE encourages Fellows to lead state-wide Lesson Study Initiatives/other professional development programs.
- Virginia DOE recognizes Endeavor courses as meeting required certification renewal professional development hours.
- Adams State College, Alamosa, Colorado, awards 15 graduate credits for completion of Endeavor courses.
- Adams State College is engaged in discussions to establish a Master's Degree program in Curriculum and Instruction in STEM Education with Endeavor coursework comprising the primary offerings.

PROJECT CONTRIBUTIONS TO PART MEASURES (INCLUDE DATA PLUS EXPLANATION)

2 Long-Term Professional Development

Measure

Percentage of elementary and secondary educators who participate in NASA training programs and use NASA resources in their classroom instruction.

Contribution

40 Endeavor Fellows have completed between 2 and 5 of the required online graduate NASA STEM courses during FY09. The expected timeline for an educator to complete all courses required to achieve the Certificate in STEM Education is 12 – 18 months.

100% of the Fellows remain active and have submitted a plan to their Endeavor mentor for completion of their courses.

Explanation:

Endeavor Professional Development is designed to be a sequential, long term plan. The first year builds knowledge and skills intended for instructional application to follow. Thus, the first year data is limited to the number of educator participants and the fact that 100% are progressing on schedule with their individual plan.

Evaluation and data collection for Year Two will address PART measures not only related to Long-term Professional Development but also to the impact integration of NASA content in classroom activities increases student participation in instructional and enrichment NASA STEM activities.

FY09 Data

- 40 educators participated in Endeavor professional development courses in FY09
- 100% remain active and are developing an Action Research plan that will include NASA resources and content as a part of their classroom instruction
- 21 are elementary educators; 19 are middle school/secondary educators
- 100% indicated the courses contributed to their professional growth
- 89% indicated plans to implement what they had learned during this next school year
- It has given me more confidence to teach science, and has shown me that there are many ways to look at a given science topic. – *Endeavor Fellow*
- It will influence my teaching next year. . . it has given me more confidence and valuable resources. – *Endeavor Fellow*

IMPROVEMENTS (E.G. PROJECT MANAGEMENT, EFFICIENCIES, ETC.) MADE IN THE PAST YEAR

Endeavor met the challenge in FY09 that was due to a budgetary issue related to lack of clarity as to Congressional release and availability of funds from the NASA Endeavor Teacher Fellowship Trust Fund. As a result, Endeavor was rescopeed and expected Year One development activities placed on hold. A favorable resolution allowed for avoided impact felt by Cohort I Fellows with some Year One elements now included in performance goals for Year Two.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT

By design, Endeavor's partnership with Teachers College, Columbia University has been significant in ensuring rigor of online courses and a high degree of credibility to the issued Certificates in STEM Education. Additionally, this partnership is key in exploring opportunities for publishable, academic research to be conducted with this project.

Partners and their role include:

- U.S. Satellite Laboratory, Inc.
 - Administers and implements the Endeavor Project
- Teachers College, Columbia University
 - Awards a NASA Endeavor Certificate in STEM Education
 - Interactions/involvement of Science Department
 - Teachers College instructors teach majority of online courses
 - Exploring opportunities for academic research based on Endeavor
 - Dr. Felicia Moore-Mensa, Director of the Urban Science Center is a member of the Endeavor Selection Committee
 - Exploring a collaboration between Endeavor and the New York City Department of Education
- Maine State Department of Education
 - Publicize Endeavor to educators
 - Endeavor courses accepted toward certification in general, physical or biological sciences.
- Florida State Department of Education
 - Encourage Fellows to lead Lesson Study initiatives and state-wide professional development programs.
 - Two Endeavor courses count toward Alternate-route credentialing.
 - Exploring relationship between Endeavor courses and certification in Middle School Science.
- Virginia State Department of Education
 - Endeavor courses count as professional development hours required to renew teaching certifications.
- Adams State College, Alamosa, Colorado
 - Discussions in progress to count all Endeavor courses toward a Masters in Curriculum and Instruction in STEM Education. An announcement may be forthcoming in January 2010.
- Teach for America
 - Discussions in progress for inclusion of Teach for America/Endeavor Fellows