



Board of Regents Program Action Request
University of Alaska
Proposal to Add, Change, or Delete a Program of Study

1a. Major Academic Unit (choose one) UAS	1b. School or College School of Education	1c. Department or Program School of Education																																								
2. Complete Program Title Master of Education (M.Ed.) in Science Education, K-8																																										
3. Type of Program <input type="checkbox"/> Undergraduate Certificate <input type="checkbox"/> AA/AAS <input type="checkbox"/> Baccalaureate <input type="checkbox"/> Post-Baccalaureate Certificate <input checked="" type="checkbox"/> Master's <input type="checkbox"/> Graduate Certificate <input type="checkbox"/> Doctorate																																										
4. Type of Action <input checked="" type="checkbox"/> Add <input type="checkbox"/> Change <input type="checkbox"/> Delete		5. Implementation date (semester, year) <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring Year 2014																																								
6. Projected Revenue and Expenditure Summary. Not Required if the requested action is deletion. (Provide information for the 5 th year after program or program change approval if a baccalaureate or doctoral degree program; for the 3 rd year after program approval if a master's or associate degree program; and for the 2 nd year after program approval if a graduate or undergraduate certificate. If information is provided for another year, specify (1st) and explain in the program summary attached). Note that Revenues and Expenditures are not always entirely new; some may be current (see 7d.)																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Projected Annual Revenues in FY 2016</th> </tr> <tr> <td>Unrestricted</td> <td></td> </tr> <tr> <td>General Fund</td> <td>\$21,058</td> </tr> <tr> <td>Student Tuition & Fees</td> <td>\$77,418</td> </tr> <tr> <td>Indirect Cost Recovery</td> <td>\$0</td> </tr> <tr> <td>TVEP or Other (specify): NA</td> <td>\$0</td> </tr> <tr> <td>Restricted</td> <td></td> </tr> <tr> <td>Federal Receipts</td> <td>\$0</td> </tr> <tr> <td>TVEP or Other (specify): NA</td> <td>\$0</td> </tr> <tr> <td>TOTAL REVENUES</td> <td>\$98,476</td> </tr> </table>		Projected Annual Revenues in FY 2016		Unrestricted		General Fund	\$21,058	Student Tuition & Fees	\$77,418	Indirect Cost Recovery	\$0	TVEP or Other (specify): NA	\$0	Restricted		Federal Receipts	\$0	TVEP or Other (specify): NA	\$0	TOTAL REVENUES	\$98,476	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">Projected Annual Expenditures in FY</th> </tr> <tr> <td>Salaries & benefits (faculty and staff)</td> <td>\$48,972</td> </tr> <tr> <td>Other (commodities, services, etc.)</td> <td>\$ NA</td> </tr> <tr> <td>TOTAL EXPENDITURES</td> <td>\$ NA</td> </tr> <tr> <td colspan="2">One-time Expenditures to Initiate Program (if >\$250,000)</td> </tr> <tr> <td colspan="2">(These are costs in addition to the annual costs, above.)</td> </tr> <tr> <td>Year 1</td> <td>\$ NA</td> </tr> <tr> <td>Year 2</td> <td>\$ NA</td> </tr> <tr> <td>Year 3</td> <td>\$ NA</td> </tr> <tr> <td>Year 4</td> <td>\$ NA</td> </tr> </table>	Projected Annual Expenditures in FY		Salaries & benefits (faculty and staff)	\$48,972	Other (commodities, services, etc.)	\$ NA	TOTAL EXPENDITURES	\$ NA	One-time Expenditures to Initiate Program (if >\$250,000)		(These are costs in addition to the annual costs, above.)		Year 1	\$ NA	Year 2	\$ NA	Year 3	\$ NA	Year 4	\$ NA
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Page # of attached summary where the budget is discussed, including initial phase-in: 5																																										
7. Budget Status. Items a., b., and c. indicate the source(s) of the General Fund revenue specified in item 6. If any grants or contracts will supply revenue needed by the program, indicate amount anticipated and expiration date, if applicable.																																										
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8. Facilities: New or substantially (>\$25,000 cost) renovated facilities will be required. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, discuss the extent, probable cost, and anticipated funding source(s), in addition to those listed in sections 6 and 7 above.																																										
9. Projected enrollments (headcount of majors). If this is a program deletion request, project the teach out enrollments.																																										
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¹Sometimes the courses required by a new degree or certificate program are already being taught by an MAU, e.g., as a minor requirement. Similarly, other program needs like equipment may already be owned. 100% of the value is indicated even though the course or other resource may be shared.

Page number of attached summary where demand for this program is discussed: 4

10. Number* of new TA or faculty hires anticipated (or number of positions eliminated if a program deletion):

Graduate TA	0
Adjunct	0
Term	0
Tenure track	0

11. Number* of TAs or faculty to be reassigned:

Graduate TA	0
Adjunct	0
Term	0
Tenure track	0

Former assignment of any reassigned faculty:
For more information see page of the attached summary.

12. Other programs affected by the proposed action, including those at other MAUs (please list):

Program Affected	Anticipated Effect
Mathematics Education M.Ed.	Increased students will fill the rosters of some Mathematics Education program courses. These courses will be more economical because enrollment will be higher.
Technology Education M.Ed.	Increased students will fill the rosters of some Technology Education program courses. These courses will be more economical because enrollment will be higher.

Page number of attached summary where effects on other programs are discussed: 5

13. Specialized accreditation or other external program certification needed or anticipated. List all that apply or 'none':

14. Aligns with University or campus mission, goals, core themes, and objectives (list):
UA Strategic Direction Initiative #2: Productive Partnerships with Alaska's schools

UAS Vision, UAS Mission, and the UAS Core Themes & Objectives:

1. Core Theme: Student Success
Objective: Access
Objective: Success
2. Core Theme: Teaching and Learning
Objective: Breadth of Programs and Services
Objective: Effectiveness and Efficiency
3. Core Theme: Community Engagement

Page in attached summary where alignment is discussed: 3

15. State needs met by this program (list):

Aligns with UA "Shaping Alaska's Future" theme on partnerships with K-12

UA Teacher Education Plan and SB241 Report shows that science instruction is a high needs area for the state of Alaska.

No graduate master's degree program in Science Education exists in Alaska.

Helps meet the demand for science education leaders in the state of Alaska.

Helps UA respond to state workforce needs for highly qualified science teachers.

Page in the attached summary where the state needs to be met are discussed: 2

16. Program is initially planned to be: (check all that apply)

- ☐ Available to students attending classes at campus(es).
- ☒ Available to students via e-learning.
- ☐ Partially available students via e-learning.

Page # in attached summary where e-learning is discussed: 5

Submitted by the University of Alaska Southeast with the concurrence of its Faculty Senate.
(choose one above)

R. Sengupta
Provost

11/4/13
Date

R. Caulfield
Chancellor

11/4/13
Date

For J. Pierce

- ☒ Recommend Approval
☐ Recommend Disapproval

[Signature]
UA Vice President for Academic Affairs on behalf of
the Statewide Academic Council

11/18/2013
Date

*Net FTE (full-time equivalents). For example, if a faculty member will be reassigned from another program, but his/her original program will hire a replacement, there is one net new faculty member. Use fractions if appropriate. Graduate TAs are normally 0.5 FTE. The numbers should be consistent with the revenue/expenditure information provided.

Attachments:

☒ Summary of Degree or Certificate Program Proposal

☐ Other (optional)

Revised: 10/10/2012

University of Alaska New Program Proposal
Board of Regents Proposal

**Master of Education in Science Education, K-8
University of Alaska Southeast**

Submitted by the School of Education, Deborah Lo, Ph.D., Dean

Program Developed by
Lee Graham, Ph.D., Associate Professor, Technology Education
Claude McMillan, Ph.D., Assistant Professor, Science Education
Virgil G. Fredenberg, Ed.D., Associate Professor, Mathematics Education

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Degree Title

Master of Education (M.Ed.) in Science Education, K-8

Educational Goals and Rationale

Science instruction is a high needs area for the nation and the state of Alaska UA Teacher Education Plan (2011). No graduate level master's degree program in Science Education, K-8 exists in Alaska. The proposed Master of Education Program in Science Education is an advanced degree program designed to fill this void. It is designed for certified K-8 teachers to allow them to increase their understanding of science pedagogy, strengthen their knowledge base in the science content they teach, and become science education leaders and specialists.

The proposed program has six goals:

- Goal 1: Create an endorsement that will effectively model appropriate science teaching, learning, assessment and evaluation practices for teachers to (1) experience as a "student learner;" (2) have the opportunity to understand and integrate "modeled" practices into their own teaching; (3) learn to further analyze and evaluate science teaching and learning; and (4) develop a plan for personal professional development to become a more effective science teacher.
- Goal 2: Practicing teachers will become dynamic and knowledgeable leaders in the field of teaching science for their school building, their school district and the state of Alaska.
- Goal 3: Practicing teachers will strengthen their understanding of science both in depth and breadth.
- Goal 4: Practicing teachers will become better prepared to teach the full spectrum of K-8 science.
- Goal 5: Create a strong program that leads to an M.Ed. with an endorsement in K-8 science education.
- Goal 6: Assist teachers of middle school science to attain their goal of becoming highly qualified.

The science content of this program is designed to strengthen understanding of science in general, with special emphasis on scientific inquiry and the content taught in the K-8 curriculum. Thus, all science content in the program courses will be based on the Alaska State Content and Performance Standards for Science, the Next Generation Science Standards, and the NSTA Standards for Science Teacher Preparation.

This proposed program is designed to provide pedagogy appropriate for the teaching of science with options for increasing the teacher's understanding of content area literacy, the inclusion of students with special needs and utilizing technology to teach science. An emphasis will be placed on helping the teachers in the program see the connections of science to local communities and cultures through the application of science to real-life problem situations.

Program Admission Requirements

Applicants must provide:

- A copy of a current teaching certificate;
- A completed graduate application;
- Official undergraduate/graduate transcripts with a minimum 3.0 GPA; as well as
- Two letters of recommendation

To successfully graduate from this program, candidates must maintain a GPA of 3.0 and complete the required professional portfolio.

Relevance to the University Mission

This program will help the UA system meet its goal for Shaping Alaska's Future (SDI) by expanding partnerships with Alaska's K-12 schools. Its objective is to respond to state workforce needs for highly qualified science teachers. It also addresses the objective of developing new and relevant programs that expand the range of degree programs and opportunities to deliver graduate training through distance delivery. It helps meet the goal of the UAS strategic plan of assisting current teacher education practitioners to make progress toward their professional development goals and to respond to the demands of the state and nation by providing teachers with opportunities to obtain graduate degrees in high-need areas.

The M.Ed. Program in Science Education is an advanced degree program for certified teachers. It will consist of 36 graduate-level credits: 18 credits in science content and pedagogy and problem solving; 9 credits in leadership, technology and instructional design; 6 credits in an internship and a capstone master's degree portfolio course; and 3 credits of special topics in STEM (Science Technology Engineering and Mathematics). The Science Education major joins two other STEM programs at UAS: Educational Technology and Mathematics Education. These three programs will share seven common core courses, five existing and two new courses. The two new common courses and the five science education courses, will all share the EDSC subject code.

Collaboration with Other Universities within University of Alaska

It is expected that the UAS School of Education (SOE) will collaborate with the other universities within the University of Alaska. If a similar program is developed at UAA or UAF, it is expected that UAS SOE will work to coordinate the courses in both programs to facilitate ease of transfer. It is also expected that courses in programs at UAA and UAF that are similar to those in the UAS Science Education program will be accepted into the M.Ed. Program in Science Education where appropriate.

Because most of the courses in the program are taught through e-learning, it is expected that as demand increases, faculty with appropriate expertise at the other universities in the UA system may be approached to teach courses within the program.

Universities with Similar Programs

Other universities offer a Master of Education in Science Education. However, no such degree program is offered within the state of Alaska. Typically, the programs emphasize understanding of science, science pedagogy, and the preparation of teachers for leadership roles in science education. The typical master's degree in science education contains courses that emphasize science content at the appropriate levels as well as pedagogy.

Master's degrees in science education are offered at a variety of universities across the United States, the programs from these universities were reviewed:

- Colorado State University
- Oregon State University
- University of Minnesota
- Texas Tech University

The proposed M. Ed. in Science Education shares some similarities with programs at these universities. All emphasize the understanding of science content and the teaching and learning of that content. All contain a research component and the use of technology in the teaching of science. Content areas in some, if not all, of these programs include: physics, chemistry, earth and space science, life science, and the great ideas in science. The incorporation of pedagogy into the content courses is emphasized in these programs as is the use of technology to teach science. All include a research component and a capstone project in some form.

Demand for Program

The proposed M.Ed. Program in Science Education will help meet the demand for science education leaders in the state of Alaska. It will help meet the demand for knowledgeable K-8 teachers of science who understand science and how science connects to local communities and cultures through the application of science to real-life problem situations. Research on applications of science to local, real-life problems and situations has shown they strengthen student understanding of science. Student understanding of science is a critical area in Alaska. This program will have an impact on school students' understanding of science and will improve their probability of success in high school science classes.

This proposed program meets the need in the state for a M.Ed. Program in Science Education. Currently, no such program exists. The program will help the UA system meet its goal and objective of responding to state workforce needs for highly qualified science teachers. It also addresses the objective of UA System Goal 2 to develop new and relevant programs that expand the range of degree programs and opportunities to deliver graduate training through distance

delivery. It helps meet the goal of the UAS strategic plan of assisting current teacher education practitioners to make progress toward their professional development goals and to respond to the demands of the state and nation by providing teachers with opportunities to obtain graduate degrees in high-need areas.

The State of Alaska will eventually respond to the Next Generation Science Standards published in April 2013 and already adopted by many states. The decision whether to adopt or reject these standards and rewrite the existing science standards for Alaska will require a cadre of science educators steeped in the NGSS. This program will provide that.

Schedule of Implementation

- Spring, 2014: With approval from the UA Board of Regents and the Northwest Commission on Colleges and Universities (NWCCU) the Master of Education in Science Education program will be added to the AY 2014-2015 UAS Catalog. Online pages will be updated.
- Summer, 2014: Teachers will be allowed to apply to the M.Ed. in Science Education program. Courses with the EDSC subject code will be offered for the first time.
- AY 2014-2015: The M.Ed. in Science Education program will be published in the UAS Catalog.
- Fall, 2014: The first content and pedagogy courses in Science Education will be offered to teachers in the Science Education program.

Projection of Enrollments

In the first year of the program, it is expected that 4 teachers will be admitted into the Science Education M.Ed. program. By the second year, five additional teachers are projected to be admitted into the program; six in year three and 6 by year four. Because of the success of the Technology Education and Mathematics Education M.Ed. programs, it is expected that the Science Education M.Ed. program will experience similar success.

Faculty Resources

Because the Science Education M.Ed. shares seven common courses with the Technology and Mathematics Education M.Ed. programs, it is expected that no additional faculty resources will be needed. The additional courses in the Science Education M. Ed. will all be taught by faculty already teaching in the School of Education at UAS. One half of Assistant Professor Chip McMillan's workload will be reallocated internally to the M.Ed. in Science Education degree program. The reallocation of one-half of Dr. McMillan's salary and benefits (\$48,972) is addressed in the Board of Regents Program Request form attached to this document.

Library and Other Equipment Needs

Egan Library resources, including serials, books, online databases and other electronic media, are sufficient to support the scholarly resource requirements of the M. Ed. in Science Education.

The technology services and facilities at UAS are sufficient to support the e-Learning/distance teaching requirements of the M. Ed. in Science Education.

New Facilities Needed

No new facilities are needed to implement the program.

Projected Costs

The costs for implementing this new program are projected to be modest. Since seven of the twelve courses needed for this program are existing courses, or courses that will be required in the Mathematics Education and Technology Education programs, the costs for this program will be limited to .5 FTE salary for one existing faculty member whose workload will be modified to cover this need. Other costs for advising and marketing will be covered internally by the School of Education. In addition, this program will likely increase the enrollment in those seven shared courses for better utilization.

Concurrence of Appropriate Advisory Councils

The faculty of the School of Education at UAS has approved the proposal.

The graduate curriculum committee has approved the proposal.

The UAS Faculty Senate has approved the proposal.

Executive Summary

The proposed Master of Education Program in Science Education allows the UA system to fill a void in a high needs education area for the state of Alaska. It allows K-8 teachers to expand their understanding of science pedagogy and science content. It increases the number of science education leaders and specialists across the state.

The degree's emphasis on the application of science to local communities and cultures can help K-8 students see the connections between science and real-life problems and situations and help Alaska schools become more culturally responsive. Improving the teaching of science in the state of Alaska can help teachers help their students reach the Grade Level Expectations as put forth by the Alaska Department of Education & Early Development. It will increase the number of students who will take science courses in Alaska's high schools.

Proposed Curriculum

Admission Requirements

Applicants must provide:

- A copy of a current teaching certificate;
- A completed graduate application;
- Official undergraduate/graduate transcripts with a minimum 3.0 GPA; and
- Two letters of recommendation

Program Completion

To successfully graduate from this program, candidates must complete the following courses with a minimum GPA of 3.0 and complete the required professional portfolio.

Science education courses:

- EDSC 601 Physics Content for K-8 Teachers (3)
- EDSC 602 Chemistry Content for K-8 Teachers (3)
- EDSC 603 Earth and Space Science Content for K-8 Teachers (3)
- EDSC 604 Life Science Content for K-8 Teachers (3)
- EDSC 605 Great Ideas in Science: An Overview for K-8 Teachers (3)

Additional common core courses required in the STEM education programs:

- EDET 636 Impact of Technology on Student Learning (3)
- EDET 637 Differentiated Instruction Through Technology (3)
- EDMA 608 Mathematical Problem Solving (3)
- EDSC 675 Special Topics in STEM (3)
- EDSC 691 Internship in STEM (3)
- EDET 668 Educational Technology Leadership (3)
- EDMA 698 Master's Portfolio (3)

Course Descriptions

The first five courses listed below, 15 credits, are the content courses in the M.Ed. in Science Education program. They must be taken in sequence: EDSC 601, EDSC 602, EDSC 603, EDSC 604, and EDSC 605. The seven additional courses, 21 credits, listed below these complete the requirements for the M.Ed. in Science Education. They are common to the three STEM programs: Technology Education, Mathematics Education, and Science Education.

Science Education Program Content Courses

EDSC 601 Physics Content for K-8 Teachers (3)

Course Description: Part One of a two-semester course sequence examines the fundamental concepts of physical science: physics and then chemistry. Instruction models appropriate teaching practices for the K-8 classroom. Course utilizes web-based “texts,” simulations, virtual labs; materials sent by instructor to students in kit form, as well as typical household materials.

EDSC 602 Chemistry Content for K-8 Teachers (3)

Course Description: Part Two of a two-semester course sequence examines the fundamental concepts of physical science; physics and then chemistry. Instruction models appropriate teaching practices for the K-8 classroom. Course utilizes web-based “texts,” simulations, virtual labs; materials sent by instructor to students in kit form, as well as typical household materials. Prerequisite: EDSC 601.

EDSC 603 Earth and Space Science Content for K-8 Teachers (3)

Course Description: Examines the fundamental concepts of earth and space science. Instruction models appropriate teaching practices for the K-8 classroom. Course utilizes web-based “texts,” simulations, and virtual labs; materials sent by instructor to students in kit form, as well as typical household materials. Prerequisite: EDSC 602.

EDSC 604 Life Science Content for K-8 Teachers (3)

Course Description: Examines the fundamental concepts of life science. Instruction models appropriate teaching practices for the K-8 classroom. Course utilizes web-based “texts,” simulations, virtual labs; materials sent by instructor to students in kit form, as well as items from the local environment. Prerequisite: EDSC 603.

EDSC 605 Great Ideas in Science (3)

Course Description: Examines the greatest ideas/notions in science. Instruction models appropriate teaching practices for the K-8 classroom. Course utilizes web-based “texts,” simulations, virtual labs. Prerequisite: EDSC 604.

STEM Education Programs Common Core Courses

EDMA 608 Mathematical Problem Solving: An Overview for K-8 Teachers (3)

Examines the underlying concepts of solving problems using mathematical models, logic, and concepts. Identifies problem-solving strategies appropriate to K-8 classrooms. Provides practice developing research and standards based instruction and assessment plans that support an integrated problem based curriculum.

EDET 636 The Impact of Technology on Student Learning (3)

Techniques, tools and strategies for predicting and assessing the effectiveness of technology tools/interventions on student learning. Requires access to a classroom for at least two days a week during at least three weeks of the course in order to complete the portfolio assignment. Requires reliable Internet and ability to download software applications for evaluation.

EDET 637 Differentiating Instruction through Technology (3)

Focuses on the use of technology as a tool to gauge and facilitate the needs and interests of diverse learners in the classroom.

EDET 668 Educational Technology Leadership (3)

Provides a reflective overview of issues relating to school leadership policy and practice in the field of educational technology. Encompasses the wide range of responsibilities of the school technology leader as a collaborative member of a leadership team. Topics include organizational change, decision making, community partnerships, legal and ethical issues, coaching and mentoring, and teamwork. A web-based course; requires Internet and e-mail.

EDSC 675 Special Topics in STEM (3)

Affords examination of a special topic or problem in the STEM fields. Topics, problems and content will vary as STEM issues are updated. This course will be required for the M.Ed. programs in Mathematics Education, Technology Education and Science Education.

EDSC 691 Internship in STEM (3)

Internship for Technology Education, Mathematics Education, and Science Education students. Students will work in their STEM area of concentration with K-8 students. Prerequisite: Admission to a graduate program in the UAS School of Education.

EDMA 698 Masters Portfolio (3)

The portfolio should document the required knowledge and ability to apply the standards set by the conceptual framework of the UAS School of Education. Students creating a portfolio should request portfolio criteria from the School of Education or their graduate advisor. An oral defense of the portfolio may be required by the student's graduate committee.