

TITLE: Consideration of Provisional State Approval of the University of Hawaii at Manoa College of Education Ethnomathematics Program to Add a Field to Existing Hawaii Licenses

The Hawaii Teacher Standards Board approves the recommendation of the Educator Preparation Program (EPP) Review Team to grant provisional approval to the University of Hawaii at Manoa College of Education for its Ethnomathematics Preparation Program, effective September 7, 2018, through December 31, 2021.

The team's findings in the attached review report commend the program of study as appropriate and valuable to teachers who will be adding the Ethnomathematics field; the assessments and supporting rubrics have potential to provide strong evidence for meeting all pertinent standards; and all program faculty are appropriate for this field.

The program may recommend candidates completing this program after September 7, 2018, to add the following fields to an existing Hawaii license:

Ethnomathematics K-6
Ethnomathematics 6-12
Ethnomathematics K-12

The unit must also meet the following requirements:

Include information on this program in its annual report to the HTSB;
Include this program in the Unit's next accreditation review for consideration for continuing full approval.

Submitted by: Felicia Villalobos

Referred to: Teacher Education Committee

HAWAI'I TEACHER STANDARDS BOARD
EDUCATOR PREPARATION - ADD A NEW FIELD
UNIVERSITY OF HAWAII - MANOA
ETHNOMATHEMATICS

SATE Review Team Recommendations

The SATE Review Team recommends provisional approval for the add on field of Ethnomathematics to an existing teaching license.

Program of Study: The coursework is appropriate to teachers who are adding the field of Ethnomathematics.

Standards & Assessments: The assessments submitted by the program have the potential to provide evidence for meeting all pertinent Standards for Mathematical Practice. Each assessment is supported by a well-written rubric.

Faculty: The roles, degrees and professional experience seem to be in alignment with the needs of the program.

Review Team

Colleen O'Neil, M.Ed.: Associate Commissioner of the Educator Talent unit, Colorado; Colleen holds her teacher, principal and superintendent license in the state of Colorado.

LaShone Allen: National Board-Certified Math Facilitator and 20-year veteran math teacher in Charlotte, North Carolina.

Carolyn Gyuran: Education Consultant, CAEP Reviewer, CEC SPA Reviewer.

CONTENT AND CONTEXT INFORMATION

1. Unit name and address

Name	University of Hawai'i at Mānoa College of Education
Address	1776 University Ave., Everly Hall 224, Honolulu, HI 96822

2. Unit administrator

Name	Nathan Murata
Title	Dean
Email address	nmurata@hawaii.edu
Telephone number	808-956-4714

3. Program Administrator, if different from Unit Administrator

Name	Amelia Jenkins
Title	Associate Dean
Email address	amelia@hawaii.edu
Telephone number	808-956-4451

4. Name of new program or field(s) to be added to existing program.

Name of Program	License Field(s)	License Level(s)	Projected Implementation Date
Ethnomathematics Graduate Certificate	Ethnomathematics	K-6, 6-12, K-12	8/1/2018
M.Ed. Curriculum Studies, Math Education and Ethnomathematics Graduate Certificate	Ethnomathematics	K-6, 6-12, K-12	8/1/2018

5. If this is a new program, attach an organizational chart of your institution/agency and, if applicable, college/school/department showing the placement of this program.

Please refer to the attachments: (1) University of Hawai‘i at Mānoa College of Education (UHM COE) Organizational Chart and (2) Department of Curriculum Studies (EDCS) Organizational Chart.

6. Justification for implementing the program. Summarize the current market for this program’s completers employment outlook and any other contexts that shape the program.

Purpose and Objectives of the Program and the Current Market

The University of Hawai‘i at Mānoa College of Education (UHM COE) has a number of high quality graduate programs, and has recognized the need for one specifically focused on ethnomathematics. The ethnomathematics graduate certificate reflects a concerted effort to respond to the need for scholars and practitioners to develop and understand mathematics teaching practices informed by cultural knowledge, values, languages, histories, and traditions of the populations we are endeavoring to serve.

The purpose of the ethnomathematics graduate certificate is to recruit and prepare high-quality K–12 teachers as leaders, and transfer culturally-sustaining mathematics knowledge gained to the classroom, school, and district levels. We will accomplish this by: (1) increasing knowledge of culturally- sustaining mathematics content aligned with K–12 federal and state standards and assessments; (2) preparing teachers as leaders to provide instruction and professional development (PD) in ethnomathematics in their schools, districts, and communities; and (3) strengthening sustainable campus-community networks leading to college, career, and community readiness.

The ethnomathematics graduate certificate will build upon successes, challenges, and lessons learned from the grant-funded Ethnomathematics Institute, which is currently in

its tenth year. For the first five years at the University of Hawai‘i - West O‘ahu (UHWO), performance measures included a 1400% increase in the number of students enrolled in mathematics courses as the general student body population grew from 940 students in 2007 to 2,361 students in 2013 (UH IRO, 2016). This led to the principal investigator (PI) Dr. Linda Furuto developing 11 new mathematics courses tied to institutional learning outcomes, accreditation, and graduation requirements as an Associate Professor of Mathematics at UHWO, all of which are grounded in ethnomathematics. Over the past five years, the Ethnomathematics Institute transitioned into a yearlong PD program for K–12 educators at UHM where the PI Dr. Linda Furuto is a Professor of Mathematics Education. More than 80 educators from public, public charter, and private schools have participated, including all 15 complex areas and seven districts of the Hawai‘i State Department of Education (HIDOE). Thus far, 37 K–12 teachers have completed additional requirements to obtain six HIDOE PD credits. This has formed an integrated statewide network that demonstrates both a need and commitment to improving learner outcomes, particularly in underserved and underrepresented populations.

The opportunity to proceed with the proposed ethnomathematics graduate certificate became more pressing with the Polynesian Voyaging Society’s (PVS) current Mālama Honua Worldwide Voyage of the Hōkūle‘a canoe. The *Promise to Children* is the educational sail plan and was authored by leaders throughout the State of Hawai‘i and Pacific, including Ethnomathematics Institute project partners: University of Hawai‘i System (UHS), Hawai‘i State Department of Education (HIDOE), Hawai‘i P–20 Partnerships for Education, Pacific American Foundation, and Pacific Resources for Education and Learning. The *Promise to Children* embraces the values of wayfinding to navigate a movement dedicated to future generations stating, “We believe the betterment of humanity is inherently possible, and we believe our schools, from early childhood education through advanced graduate studies, are a powerful force for good. This is the voyage of our lifetimes...the University of Hawai‘i’s 10 campuses have active programs and projects to achieve this goal such as...*ethnomathematics learning*” [emphasis added] (p. 3). Our network of partners provides opportunities to broadly market the program and encourage participation by a diverse group of teachers.

According to Ethnomathematics Institute post-program survey data in response to “The PD helped me to better my understanding of culturally- sustaining STEM pedagogy aligned with federal and state standards (e.g., Mathematics Common Core State Standards, Next Generation Science Standards, Nā Hopena A‘o) (5 point scale with 5 being strongly agree),” the results were: 4.72 (2013–2014), 4.90 (2014–2015), 4.95 (2015–2016), and 4.95 (2016–2017). Another indication of the impact of the PD was that 100% of the teachers participated in all aspects of the program and project evaluation this past year 2016–2017.

Given our performance history and network of collective impact, we are ready for the next step of building a pathway from PD to an ethnomathematics graduate certificate. The 15-credit ethnomathematics graduate certificate is designed to lead into the M.Ed. Curriculum Studies Mathematics Education track, or other COE programs. If a student goes on to complete the M.Ed. Curriculum Studies while concurrently enrolled in both programs, he/she will receive both a master’s degree and a certificate. This arrangement

leverages resources to provide an attractive option for our graduate students. There are no other master's degrees (or master's degree tracks) in mathematics education at any UHS institution, aside from the University of Hawai'i at Mānoa.

Context and Population Served by the Program

The ethnomathematics graduate certificate will admit cohorts of approximately 20 students, and there will be no cohort overlap (e.g., Summer-3 credits, Fall-6 credits, Spring-6 credits). The ethnomathematics graduate certificate provides opportunities to study in-depth, contextualized content and pedagogy for K–12 educators by connecting interdisciplinary learning to the local ecological, cultural, historical, and political contexts in which schooling takes place.

The HIDOE website affirms, “Our unique values, sense of place, and strong community relationships are increasingly important here and around the world.” By developing teachers as leaders in ethnomathematics, we encourage retention of excellent classroom teachers and support application of their expertise in order to achieve school improvement. For example, in the words of an Ethnomathematics Institute participant, “The PD is inspiring and motivating, especially to teachers who identify themselves as being in a rut.” Another 15-year veteran HIDOE teacher said the PD “refined and refreshed my vision, and even my colleagues at school notice a change.” Teacher leaders who graduate from the program will increase the preparedness of students to enter the UHS and contribute to island and state economic development.

Program Organization

All applicants must meet UHM Graduate Division admissions standards and requirements. To be eligible, an applicant must hold or expect to hold prior to matriculation a bachelor's degree from a regionally accredited U.S. college or university, or an equivalent degree from a recognized non-U.S. institution of higher education. At minimum, the applicant needs to demonstrate above average academic performance (B average, usually a 3.0 on a 1.0–4.0 scale) for undergraduate course work and for any post-baccalaureate or graduate course work. Because the number of qualified applicants typically exceeds the number of spaces available, admission is competitive. Meeting minimum admissions standards will not guarantee admission. Additional requirements specific to the ethnomathematics graduate certificate include teaching experience in grades P–20 (early childhood through university) or equivalent experience.

The ethnomathematics graduate certificate has been reviewed and endorsed by the Department of Curriculum Studies, College of Education (COE) Dean, COE Committee for Curriculum & Program Planning, COE Senate, UHM Graduate Division, UHM Chancellor, UH System President, and HIDOE Superintendent. The program combines the expertise of these organizations in curriculum, instruction, and place-based education, particularly as they relate to Hawai'i's schools.

According to the former HIDOE Superintendent Kathryn Matayoshi in a letter dated April 24, 2017, “Supporting the UHM ethnomathematics graduate certificate and HTSB add-a-field of ethnomathematics will enable us to reach our strategic goals. The new academic program will help current and future teachers integrate culturally-sustaining pedagogies into their daily practice, inspire young people to engage more deeply with

math by discovering it in the surrounding world, and ultimately better prepare students for the rigorous demands of college, career, and life.”

UHS President David Lassner further states in a letter dated April 21, 2017, “This letter expresses my endorsement for ethnomathematics, which is on your add-a-field agenda...the University of Hawai‘i System includes 10 campuses and educational, training, and research centers across the state. About 25% of our student population is Native Hawaiian. As we work to become a stronger indigenous-serving institution, programs such as the highly successful Ethnomathematics Institute help to train educators and develop curriculum using non-traditional approaches that appeal to our unique and diverse student body. Their vision of preparing K-12 teachers to provide culture- and values-based ethnomathematics instruction in schools and communities demonstrates thoughtful innovation in strengthening the educational pipeline as students move from K-12 into the university system.”

Justification for Implementing the Program and Evidence of Continuing Need

Program Objectives as a Function of the University of Hawai‘i System

According to the University of Hawai‘i System (UHS) Strategic Directions 2015–2021, UHS is committed to improving the social, economic, and environmental well-being of current and future generations. The ethnomathematics graduate certificate supports achievement of the Hawai‘i Graduation Initiative and High Performance Mission-Driven System strategic directions as follows:

- Enhance PD for K–12 teachers in support of student preparation for higher education.
- Develop degrees and certificates part of integrated pathways for students enrolled across UHS.
- Expand student-centered distance and online learning to create more educational opportunities through the use of indigenous wisdom and 21st century technology.
- Make effective use of summer terms.

Interwoven in the UHS Strategic Directions 2015–2021 is an undertaking to being a foremost indigenous-serving institution. According to the UHS Hawai‘i Papa O Ke Ao, “There are powerful motivations for the University of Hawai‘i to be supportive of its indigenous population: some of its campuses sit on ceded lands; negative Native Hawaiian social and economic statistics; and inequity of success...the best reason is because it is the right thing to do” (2012, p. 26). The ethnomathematics graduate certificate is firmly committed to advancing these directions, and will promote culture-based education and an increase in Native Hawaiian and all students in teacher education.

Program Objectives as a Function of the College of Education

Preparation of teachers for the State of Hawai‘i is the primary mission of the COE. Ours is a complex and robust college providing educational research, policy studies, curriculum development, professional development, and education services as well as teacher and educational leader preparation programs. Collaboration within and outside of the COE through our partners will help better prepare teachers as leaders needed in today’s schools. There is no existing UHS degree or certificate program of study to meet this identified need.

Program Objectives as a Function of the HIDOE and Workforce

In 2015, the HIDOE created learning outcomes that all K–12 students will achieve by graduation. Nā Hopena A‘o (HĀ) is a framework to develop the skills, behaviors and dispositions that reflect Hawai‘i’s unique context, and to honor the qualities and values of the Indigenous language and culture of Hawai‘i. The ethnomathematics graduate certificate reflects the HIDOE’s core values and beliefs in action through a sense of belonging, responsibility, excellence, aloha, total well-being, and Hawai‘i. We aim to strengthen and develop the academic achievement, character, physical and social-emotional well-being of teacher participants, ourselves, and the entire school community to the fullest potential.

By supporting school, district, and community teachers as leaders, the ethnomathematics graduate certificate will increase school effectiveness and strengthen the capacity of the state’s workforce with Nā Hopena A‘o as a foundation. According to the HIDOE (2017), 23% of secondary mathematics courses are taught by a teacher who is not state certified or licensed in mathematics. We need more mathematics teachers of all levels who are able to enhance the skills and abilities of our students through continuing education that will support equitable and quality learning in our schools and communities.

Over the past five years, the Ethnomathematics Institute has moved to a competitive application process due to HIDOE and workforce demands. Each cohort has 20 teacher participants and approximately three times that number apply for admission. According to one participant, “The program was not like any other HIDOE PD, and the only thing I would change is make it two years. Key staff modeled processes, challenged all the senses, and empowered teachers with values-based education and Nā Hopena A‘o as a framework.”

For examples of intellectual property produced by the Ethnomathematics Institute, our website contains a curriculum database of lesson plans created and implemented by past participants. These are aligned with state and federal standards and benchmarks such as Mathematics Common Core State Standards, Next Generation Science Standards, and Nā Hopena A‘o (<https://ethnomath.coe.hawaii.edu/>).

Peer-reviewed invitations to present and publish this work have been extended from organizations such as the American Educational Research Association (2018), Association of Mathematics Teacher Educators (2017), National Council of Teachers of Mathematics (2016, 2015, 2014, 2013), Hawai‘i Council of Teachers of Mathematics (2017, 2016, 2015, 2014), American Evaluation Association (2016), Smithsonian Institution Pacific Festival (2016), and International Congress on Mathematical Education (2016). In addition, the Ethnomathematics Institute has been featured in media locally and nationally highlighting employment and industry needs such as: Hawai‘i Public Radio (2015, 2010), Mathematical Association of America (2011), PBS Hawai‘i (2016), and UHS News (2015).

Coursework Specific to New Program: List courses in table and describe or attach course syllabi.

Course/Seminar/Experience	Description	Reviewer Comments
<p>EDCS 654 Ethnomathematics (3 credits)</p>	<p>Examine issues, theories, research, and practices in ethnomathematics from an interdisciplinary framework. Analysis of ethnomathematics content knowledge and pedagogy; connections among curriculum, standards, and classroom practice; examination of theory and research; and building sustainable campus-community networks.</p>	<p>EDCS 654, really seems to be the meat of the certificate program and what makes the program unique. It sets up the understanding of ethnomathematics and engages the learner. The rest of the courses seem to be more aligned with curriculum development in general and can apply to any PD program.</p>
<p>EDCS 622G Curriculum Leadership: K–14 (3 credits)</p>	<p>Foundation for critical study of curriculum development and improvement from the perspective of teacher leaders.</p>	<p>It is difficult to see the complete alignment of this course to ethnomathematics.</p>
<p>EDCS 653F Mathematics in the Schools: Integrated Math Content (3 credits)</p>	<p>School mathematics, K–12 content, curricula, pedagogy, and standards; trends and issues; theory and research in integrated math content.</p>	
<p>EDCS 606 Introduction to Research in Curriculum and Teaching (3 credits)</p>	<p>Classroom-based research covers the fundamentals of qualitative, quantitative, action research, mixed methods, and curriculum based assessment. Exploratory, explanatory, and confirmatory research will be highlighted.</p>	<p>It is difficult to see the complete alignment of this course to ethnomathematics</p>
<p>EDCS 642G Seminar in Diversity Issues: K–14 (1 credit)</p>	<p>Examination of principles, issues, theories, perspectives and practices in multicultural education that promotes awareness, encourages knowledgeable reflection and develops skills necessary for multicultural practitioners.</p>	

EDCS 699 Directed Reading and/or Research (2 credits)	Individual reading and/or research of the study in trends, research, and problems of implementation culminating in a professional teaching portfolio or another integrative final project as the capstone for this certificate aligned with the Interstate Teacher Assessment and Support Consortium and Mathematics Common Core State Standards, with connections to related readings and research.	It is difficult to see the complete alignment of this course to ethnomathematics
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Assessments/Rubrics Specific to New Program:

Students will complete a Professional Teaching Portfolio or another integrative final project as the capstone for this certificate. The Professional Teaching Portfolio is an electronic portfolio in which candidates showcase their learning aligned with the Interstate Teacher Assessment and Support Consortium and Mathematics Common Core State Standards, with connections to related literature. Students may propose other integrative projects, such as research projects or school improvement plans.

Throughout the program, course instructors and program advisors will supervise classroom and school-based projects by assessing and providing regular feedback on students’ oral reports/presentations, written projects with self-evaluations, and other classroom experiences. In all classroom and school-based projects, students will address how they will use what they have learned to engage in leadership activities at their school, district, and/or field. They also describe how they will pursue continued professional development in ethnomathematics.

Instructors and advisors will guide students’ development of their classroom, school-based, and integrative culminating projects. Summative results will be compiled and analyzed by program faculty for program decision-making and accreditation.

The ethnomathematics graduate certificate learning outcomes are grounded in three areas: knowledge and pedagogy, assessment and evaluation, and professional ethics. These are guided by the K–12 standards established by the Interstate Teacher Assessment and Support Consortium and Common Core State Standards Mathematical Practices. Please refer to Appendices A and B for additional information.

The table below provides descriptions of each assessment, when the assessment is administered, and the standards addressed. The respective templates and grading rubrics for each program assessment are attached. The templates and grading rubrics are aligned with the UHM COE Department of Curriculum Studies program assessments, and Western Association of Schools and Colleges (WASC)

accreditation frameworks.

Name of Assessment	When the Assessment is Administered	Description	Standards Addressed	Reviewer Comments
Assessment of content knowledge	EDCS 653F, EDCS 642G, and EDCS 699	Integrative project such as professional teaching portfolio	Interstate Teacher Assessment and Support Consortium (InTASC) Standards 1, 2, 3, 4, 5 Mathematics Common Core State Standards Mathematical Practices (CCSS-M) 1, 2	What is included in a professional teaching portfolio and how it is measured to ensure true assessment of knowledge about the content? This is noted as an assessment of content, but a portfolio project is not generally a full assessment of content but rather a collection of artifacts about the content.
Assessment of candidate ability to plan instruction	EDCS 622 and EDCS 654	Collaborative inquiry via project (e.g., group project to design, implement, and assess ethnomathematics curricula in school-based settings)	InTASC 6, 7, 8 CCSS-M 3	This seems to be a nice assessment aligned with expectations of the program and how one might use this learning in the educational setting. It appears to be a good way to integrate collaboration and deep inquiry while applying the learning to a local setting for what I'm thinking is an opportunity for continuous improvement of curricula.
Assessment of student teaching	EDCS 606	Professional development workshop presentation (e.g., teacher leaders engage in PD activities at their schools, districts, and/or communities by delivering workshop presentations on	InTASC 7, 8 CCSS-M 7, 8	The assessment to the new programs seems inclusive and appropriate.

		ethnomathematics)		
Assessment of candidate effect on student learning	EDCS 606 and EDCS 654	Collaborative inquiry via project (e.g., oral reports/presentations, reflections on videotapes of classroom experiences, and written projects with self-evaluations)	InTASC 1, 2, 3, 9 CCSS-M 5, 6	A project reflection is a good demonstration of learning or the candidate, but it does not describe the classroom situation in which the learning took place and/or allow for the assessment of the competency of the candidate in the classroom.
Assessment on candidate dispositions	EDCS 642G and EDCS 653F	Auto-ethnography/framework (e.g., analytic essay related to the social, political, educational, epistemological, and historical context of schooling)	InTASC 9, 10 CCSS-M 4	

Faculty Specific to New Program:

Faculty Member Name	Highest Degree & Area of Concentration	Role in Program	Professional Experience Relevant to Program	Reviewer Comments
Linda Furuto	Ph.D. Math Education	Director/Instructor	<ul style="list-style-type: none"> Professor of Mathematics Education, University of Hawai'i at Mānoa Director, Ethnomathematics and STEM Institute (2008-2017) 	The roles, degrees and professional experience seem to be in alignment with the needs of the program.
Phillippe Galicinao	M.Ed. Curriculum Studies	Instructor	<ul style="list-style-type: none"> Mathematics Teacher, Hālau Kū Māna Public Charter School Instructor, Ethnomathematics and STEM Institute (2015-Present) 	
Dewey Gottlieb	M.Ed. Educational Foundations	Advisor	<ul style="list-style-type: none"> State Mathematics Specialist, HIDOE Advisor, Ethnomathematics and STEM Institute (2008-Present) 	

Herb Lee	M.A. Political Science	Advisor	<ul style="list-style-type: none"> • Executive Director, Pacific American Foundation • Advisor, Ethnomathematics and STEM Institute (2008-Present) 	
Janel Marr	M.Ed. Curriculum Studies	Instructor	<ul style="list-style-type: none"> • Mathematics/STEM Resource Teacher, Kailua Kalaheo Complex, HIDOE • Instructor, Ethnomathematics and STEM Institute (2016-Present) 	
Antonina Monkoski-Takamure	M.Ed. Educational Technology	Instructor	<ul style="list-style-type: none"> • Teacher, Iroquois Point Elementary, HIDOE • Instructor, Ethnomathematics and STEM Institute (2013-Present) 	
Joanna Philippoff	M.S. Zoology	Project Evaluator and Instructor	<ul style="list-style-type: none"> • Assistant Specialist, Curriculum Research & Development Group, University of Hawai'i at Mānoa • Project Evaluator, Ethnomathematics and STEM Institute (2013-2016) • Instructor, Ethnomathematics and STEM Institute (2016-2017) 	
Susan Saka	M.Ed. Educational Psychology	Project Evaluator	<ul style="list-style-type: none"> • Project Evaluator, Curriculum Research & Development Group, University of Hawai'i at Mānoa • Project Evaluator, Ethnomathematics and STEM Institute (2016-Present) 	
Kaipō Tam	M.Ed. Curriculum Studies	Instructor	<ul style="list-style-type: none"> • Mathematics Specialist, Middle School Division, Kamehameha Schools Hawai'i Campus • Instructor, Ethnomathematics and STEM Institute (2014-2017); and 	

			Interim Director (2017-2018)	
Nainoa Thompson	B.A. Ocean Science	Advisor	<ul style="list-style-type: none"> • President, Polynesian Voyaging Society • Special Advisor to the President on Hawaiian Affairs, University of Hawai'i • Advisor, Ethnomathematics and STEM Institute (2008-Present) 	
Joseph Zilliox	Ed.D. Math Education	Advisor	<ul style="list-style-type: none"> • Professor Emeritus of Mathematics Education, University of Hawai'i at Mānoa • Instructor and Advisor, Ethnomathematics and STEM Institute (2013-Present) 	

Appendix A

Interstate Teacher Assessment and Support Consortium

Description

The Interstate Teacher Assessment and Support Consortium (InTASC) is a consortium of state education agencies and national educational organizations dedicated to the reform of the preparation, licensing, and on-going professional development of teachers. Created in 1987, InTASC's primary constituency is state education agencies responsible for teacher licensing, program approval, and professional development. Its work is guided by one basic premise: An effective teacher must be able to integrate content knowledge with the specific strengths and needs of students to assure that all students learn and perform at high levels.

Website

[http://www.ccsso.org/Resources/Programs/Interstate_Teacher_Assessment_Consortium_\(InTASC\).html](http://www.ccsso.org/Resources/Programs/Interstate_Teacher_Assessment_Consortium_(InTASC).html)

Standards: Content Knowledge

Standard #1: Learner Development

The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

Standard #2: Learning Differences

The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

Standard #3: Learning Environments

The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

Standard #4: Content Knowledge

The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

Standard #5: Application of Content

The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Standards: Instructional Practice

Standard #6: Assessment

The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Standard #7: Planning for Instruction

The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Standard #8: Instructional Strategies

The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Standards: Professional Responsibility

Standard #9: Professional Learning and Ethical Practice

The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Standard #10: Leadership and Collaboration

The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

Appendix B

Common Core State Standards for Mathematical Practices

Description

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the National Council of Teachers of Mathematics process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy).

Website

<http://www.corestandards.org/Math/Practice/>

Standards

Mathematical Practice 1: Make sense of problems and persevere in solving them

Mathematical Practice 2: Reason abstractly and quantitatively

Mathematical Practice 3: Construct viable arguments and critique the reasoning of others

Mathematical Practice 4: Model with mathematics

Mathematical Practice 5: Use appropriate tools strategically

Mathematical Practice 6: Attend to precision

Mathematical Practice 7: Look for and make use of structure

Mathematical Practice 8: Look for and express regularity in repeated reasoning

Assessments/Rubrics Specific to New Program

Templates and Grading Rubrics

The program learning outcomes are grounded in three areas: knowledge and pedagogy, assessment and evaluation, and professional ethics. These are guided by the K–12 standards established by the Interstate Teacher Assessment and Support Consortium (InTASC) and Common Core State Standards Mathematical Practices (CCSS-M).

The templates and grading rubrics for each of the five major assessments are aligned with the UHM COE Department of Curriculum Studies program assessments, and Western Association of Schools and Colleges (WASC) accreditation frameworks.

Name of Assessment	When the Assessment is Administered	Description	Standards Addressed
1. Assessment of content knowledge	EDCS 653F, EDCS 642G, and EDCS 699	Integrative project such as professional teaching portfolio	InTASC 1, 2, 3, 4, 5 CCSS-M 1, 2
2. Assessment of candidate ability to plan instruction	EDCS 622 and EDCS 654	Collaborative inquiry via project (e.g., design, implement, and assess ethnomathematics curricula in school-based settings)	InTASC 6, 7, 8 CCSS-M 3
3. Assessment of student teaching	EDCS 606	Professional development workshop presentation (e.g., teacher leaders engage in PD activities at their schools, districts, and/or communities by delivering workshop presentations on ethnomathematics)	InTASC 7, 8 CCSS-M 7, 8
4. Assessment of candidate effect	EDCS 606 and EDCS 654	Collaborative inquiry via project (e.g., oral reports/presentations,	InTASC 1, 2, 3, 9

on student learning		reflections on videotapes of classroom experiences, and written projects with self-evaluations)	CCSS-M 5, 6
5. Assessment on candidate dispositions	EDCS 642G and EDCS 653F	Auto-ethnography/framework (e.g., analytic essay related to the social, political, educational, epistemological, and historical context of schooling)	InTASC 9, 10 CCSS-M 4

Assessment 1: Assessment of Content Knowledge

Target (2)	Acceptable (1)	Unacceptable (0)
<p>INTERSTATE TEACHER ASSESSMENT AND SUPPORT CONSORTIUM (InTASC) STANDARDS 1, 2, 3</p> <p>LEARNER DEVELOPMENT, DIFFERENCES, AND ENVIRONMENTS</p> <p>The professional teaching portfolio (or other integrative project) successfully and accurately describes the background leading to the choice of the content topic.</p> <p>The professional teaching portfolio (or other integrative project) contents are timely and of significance to the field.</p> <p>The choice of articles to review is clearly representative of different perspectives included in the professional teaching portfolio (or other integrative project).</p>	<p>The professional teaching portfolio (or other integrative project) adequately describes the background leading to the choice of the content topic.</p> <p>The professional teaching portfolio (or other integrative project) contents are of some relevance to the field.</p> <p>Some attempt is made to provide different perspectives included in the professional teaching portfolio (or other integrative project).</p>	<p>The professional teaching portfolio (or other integrative project) makes little or no attempt to describe the background leading to the choice of the content topic.</p> <p>The professional teaching portfolio (or other integrative project) contents are of little relevance to the field.</p> <p>Only one perspective is included in the professional teaching portfolio (or other integrative project).</p>
<p>INTERSTATE TEACHER ASSESSMENT AND SUPPORT CONSORTIUM (InTASC) STANDARD 4</p>		

<p>CONTENT KNOWLEDGE</p> <p>The professional teaching portfolio (or other integrative project) allows the candidate to reveal knowledge of appropriate choices of curriculum and teaching strategies.</p> <p>In the professional teaching portfolio (or other integrative project) the candidate presents a coherent position on both curriculum and pedagogy.</p>	<p>The professional teaching portfolio (or other integrative project) allows the candidate to reveal some knowledge of appropriate choices of curriculum and teaching strategies.</p> <p>In the professional teaching portfolio (or other integrative project) the candidate presents a position on both curriculum and pedagogy.</p>	<p>Inappropriate choices are made of curriculum and strategies, or an appropriate choice is made of either curriculum or strategies.</p> <p>No clear position is evident in the professional teaching portfolio (or other integrative project).</p>
<p>INTERSTATE TEACHER ASSESSMENT AND SUPPORT CONSORTIUM (InTASC) STANDARD 5</p> <p>APPLICATION OF CONTENT</p> <p>The candidate demonstrates knowledge of research with a clear critique of applications of content.</p> <p>The professional teaching portfolio (or other integrative project) synthesizes different perspectives with the candidate's own application of content clearly presented.</p>	<p>The candidate demonstrates knowledge of research with some critique of applications of content.</p> <p>The candidate presents a synthesis with an attempt at presenting the candidate's own application of content.</p>	<p>The candidate demonstrates knowledge of research with little or an inaccurate description of applications of content.</p> <p>The candidate presents a synthesis with an incomplete attempt at presenting the candidate's own application of content; or the candidate does</p>

<p>The professional teaching portfolio (or other integrative project) precisely follows APA 6th edition in both the body and in the preparation of the reference list.</p>	<p>APA 6th edition is mostly followed in the paper.</p>	<p>not present a perspective.</p> <p>APA is not well-known.</p>
<p>COMMON CORE STATE STANDARDS MATHEMATICAL PRACTICE (CCSS-M) 1</p> <p>MAKE SENSE OF PROBLEMS AND PERSEVERE IN SOLVING THEM</p> <p>The candidate differentiates content knowledge to keep students challenged.</p> <p>The candidate models making sense of the task and the proposed solution while integrating time for meta-cognition of the situation.</p> <p>The tasks allow for multiple entry points and solution paths while requiring justifications.</p>	<p>The candidate somewhat differentiates content knowledge to keep students challenged.</p> <p>The candidate explains the reasons behind the procedural steps, but does not allow time to struggle with the task.</p> <p>The tasks are somewhat cognitively challenging, but are overly scaffolded and procedurally obvious.</p>	<p>The candidate does not differentiate content knowledge and does not keep students challenged.</p> <p>The candidate is focused solely on answers rather than processes and reasoning.</p> <p>The tasks are strictly procedural, and do not require students to check solutions for errors.</p>
<p>COMMON CORE STATE STANDARDS MATHEMATICAL PRACTICE (CCSS-M) 2</p>		

<p>REASON ABSTRACTLY AND QUANTITATIVELY</p> <p>The candidate expects students to interpret, model, and connect multiple representations.</p> <p>The candidate prompts students to articulate connections between algebraic procedures and contextual meaning.</p> <p>The tasks have relevant real-world contexts.</p>	<p>The candidate expects students to interpret and model tasks using a single representation.</p> <p>The candidate explains connections between procedures and meanings.</p> <p>The tasks are embedded in a contrived context.</p>	<p>The candidate does not expect students to interpret representations.</p> <p>The candidate expects students to memorize procedures with no connections to meaning.</p> <p>The tasks lack context, and do not make sense of multiple representations or solution paths.</p>
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This template includes knowledge, skills, and dispositions relating to:

1. Current issues and evolving trends relating to teaching and learning content;
2. Historical, socio-cultural, political and economic influences on education; and
3. Research into education as a social and political institution.

Examples:

- Prepare a professional teaching portfolio (or other integrative project) that includes a review of current trends and recommended practices from contemporary sources.
- Write a review of the literature related to an issue or trend in an area of concentration, including relevant research.
- Develop a funding proposal (including background information) that addresses a current need of students or a program that serves students.

Assessment 2: Assessment of Candidate Ability to Plan Instruction

Target (2)	Acceptable (1)	Unacceptable (0)
<p>INTERSTATE TEACHER ASSESSMENT AND SUPPORT CONSORTIUM (InTASC) STANDARD 6</p> <p>ASSESSMENT IN PLANNING INSTRUCTION</p> <p>Lesson plans reveal a suitable choice of curriculum content, are place-based when appropriate, encourage active participation of students, follow a logical sequence and consider the diverse needs of students.</p> <p>Assessment activities are integrated into the lesson plans.</p> <p>The reflections submitted in relation to the lessons taught indicate sensitivity to events and contain appropriate recommendations for future implementation.</p>	<p>Content is appropriate with some planning for the diverse needs of students.</p> <p>Assessment is planned but may not be integrated.</p> <p>Reflections submitted reveal some self-awareness of the need for potential changes with an attempt made to suggest possible changes.</p>	<p>Inappropriate choices are made of curriculum and strategies, with little or no consideration given to the diverse needs of students.</p> <p>Little or no thought is given to assessment.</p> <p>Reflections are limited in scope with few suggestions for future change.</p>
<p>INTERSTATE TEACHER ASSESSMENT AND SUPPORT CONSORTIUM (InTASC)</p>		

<p>STANDARDS 7, 8</p> <p>PLANNING FOR INSTRUCTION AND INSTRUCTIONAL STRATEGIES</p> <p>Lesson plans are research-based in that they reflect current thought in the teaching field, e.g., going beyond textbooks and commercial programs, making appropriate use of technology, and employing a variety of teaching strategies.</p> <p>The analysis of student sample work shows the candidate to be thoughtful and aware of research-based best practices in instructional strategies.</p>	<p>Lesson plans reveal some understanding of research-based strategies in instructional strategies.</p> <p>There is some analysis of student work.</p>	<p>Lesson plans show few research-based strategies in instructional strategies.</p> <p>Student work if included is not analyzed in any systematic fashion.</p>
<p>COMMON CORE STATE STANDARDS (CCSS-M) MATHEMATICAL PRACTICE 3</p> <p>CONSTRUCT VIABLE ARGUMENTS AND CRITIQUE THE REASONING OF OTHERS</p> <p>The candidate helps students differentiate between assumptions and logical conjectures.</p> <p>The candidate prompts students to evaluate peer arguments.</p>	<p>The candidate somewhat helps students differentiate between assumptions and logical conjectures.</p> <p>The candidate prompts students to evaluate peer arguments, but</p>	<p>The candidate does not ask students to present arguments or solutions.</p> <p>The candidate allows students to follow a given solution path without opportunities to make</p>

<p>The candidate expects students to formally justify the validity of their conjectures.</p>	<p>not to evaluate them.</p> <p>The candidate allows students to make conjectures with some justification.</p>	<p>conjectures.</p> <p>The candidate allows students to make conjectures without justification.</p>
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This template includes knowledge, skills, and dispositions relating to:

1. Current issues and appropriate methods/approaches for teaching;
2. Components of effective teaching; and
3. Mutually-constitutive relationships between theory and practice and between teaching and learning.

Examples:

- Engage in collaborative inquiry via project-based learning (e.g., group project to design, implement, and assess ethnomathematics curricula in school-based settings).
- Produce a video of teaching with a written analysis of the pedagogy employed.
- Develop a plan demonstrating how the curriculum is inclusive of students across all indexes of difference.

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