

New Program Code Modify Program Code

Date: 12/19/2017

REQUESTOR CONTACT INFORMATION

Name Stuart Lau Campus Mānoa, UH
 Title University Registrar Email stuartl@hawaii.edu
 Office/Dept Office of the Registrar Phone 956-5322

NEW PROGRAM CODE TO CREATE

Institution MAN - University of Hawaii at Manoa Campus MAN - University of Hawaii at Manoa
 Level GR - Graduate Effective Term Summer 2018

	Code (Max. Characters)	Description	Check if requesting new code:
College	(2) <u>50</u>	<u>Graduate Division</u>	<input type="checkbox"/> See Banner form STVCOLL
Department	(4) <u>EDCS</u>	<u>Curriculum Studies</u>	<input type="checkbox"/> See Banner form STVDEPT
Degree/Certificate	(6) <u>GCER</u>	<u>Graduate Certificate</u>	<input type="checkbox"/> See Banner form STVDEGC
Major	(4) <u>ETHM</u> EDCS	<u>Ethnomathematics</u> Curriculum Studies	<input checked="" type="checkbox"/> See Banner form STVMAJR
Concentration	(4) <u>EM</u>	<u>Ethnomathematics</u>	<input type="checkbox"/> See Banner form STVMAJR
Minor	(4) _____	_____	<input type="checkbox"/> See Banner form STVMAJR

If a similar major/concentration code exists in Banner, please list the code: _____

Justification to warrant a new major/concentration code similar to an existing major/concentration code: _____

Is this major/concentration code being used the same way at the other UH campuses? Yes No
 Should this program be available for applicants to select as their planned course of study on the online application? *If yes, student may select the code as their only program of study.* Yes No

RULES PERTAINING TO FINANCIAL AID AND 150% DIRECT SUBSIDIZED LOAN LIMIT LEGISLATION

Is 50% or greater of the classes in this program offered at a location other than the Home Campus? Yes No

Is this program/major/certificate financial aid eligible? Yes No

Does this certificate qualify as a Gainful Employment Program (Title IV-eligible certificate program)? Yes No

See <http://www.ifap.ed.gov/GainfulEmploymentInfo/index.html>

Program Length

In academic years; decimals are acceptable. The length of the program should match what is published by the campus in any online and/or written publication.

1 year

Special Program Designations A B N P T U

See *Special Program Designations Code Definitions on IRAO Program Code Request webpage*

Required Terms of Enrollment: Fall Spring Summer Extended

IRAO USE ONLY: DATE RECEIVED

ADDITIONAL COMMENTS

ATTACHMENTS

BOR Approved: Sole-credential Certificates, Associate (excluding ATS), Bachelor and Graduate Degrees, and sole credential certificates

- BOR Meeting Minutes & Supporting Documents Curriculum

Chancellor Approved: Concentrations, Certificates and Associate in Technical Studies (ATS) Degree


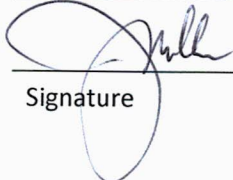
- Memo from Chancellor to notify Vice President for Academic Planning and Policy regarding program action.
 Curriculum

CERTIFICATES ONLY: Please check one (1) statement. This certificate is a...

- BOR approved certificate. BOR Meeting/Approval Date: _____
 Chancellor approved within an authorized BOR program. BOR Program: EDCS
 Chancellor approved CO in accordance with UHCCP 5.203, Section IV.B.10.

VERIFICATIONS

By signing below, I verify that I have reviewed and confirm the above information that is pertinent to my position.

<p>Registrar (Print Name)</p> <p><u>Stuart Lau</u></p> <p> _____ Signature</p> <p><u>12/19/17</u> Date</p>	<p>Financial Aid Officer (Print Name)</p> <p><u>Jodie Kuba</u></p> <p> _____ Signature</p> <p><u>12/19/2017</u> Date</p>	<p>For Community Colleges, verification of consultation with OVPC Academic Affairs:</p> <p><u>Suzette Robinson</u></p> <p>_____ Signature</p> <p>_____ Date</p>
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Fwd: Ethnomathematics Graduate Certificate

1 message

Beth Pateman <mpateman@hawaii.edu>

Tue, Dec 19, 2017 at 8:56 AM

To: Stuart Lau <stuartl@hawaii.edu>

Cc: "Wendy L. Pearson" <pearsonw@hawaii.edu>, Linda Furuto <lfuruto@hawaii.edu>

Hi, Stuart—Here are Linda's answers. Let us know if you need additional information.
Thank you,
Beth

Beth Pateman, HSD, MPH
Interim Associate Dean for Academic Affairs
Everly 128
1776 University Avenue
Honolulu, HI 96822
(808) 956-4278 or 7704

----- Forwarded message -----

From: **Linda Furuto** <lfuruto@hawaii.edu>

Date: Mon, Dec 18, 2017 at 10:18 PM

Subject: Re: Ethnomathematics Graduate Certificate

To: Beth Pateman <mpateman@hawaii.edu>

Cc: Patricia Espiritu Halagao <phalagao@hawaii.edu>, Andrea Bartlett <bartlett@hawaii.edu>

Aloha Beth,

Thank you very much for your email. Please kindly see below for my responses in **BLUE** to Stuart's questions.

1. Length of program in years **The program is 11 months (so 1 year?).**
2. Minimum number of credits required **15 credits.**
3. Required semesters (Fall/Spring/Summer/Extension) **Summer, Fall, Spring (e.g., Summer 2018, Fall 2018, Spring 2019).**
4. Is 50% of the program offered at a location other than the home campus. **No.**

Question: Would there be a masters or PhD level program that this certificate would be housed under? **The Ethnomathematics GCERT can either stand alone, or it may lead into a MEd CS Math Education (if a student chooses to pursue this path). By completing the Ethnomathematics GCERT, a student is halfway to finishing the MEd CS Math Education.**

Please let me know if you have any questions. Again, thank you very much!

Aloha,
Linda

On Mon, Dec 18, 2017 at 3:06 PM, Beth Pateman <mpateman@hawaii.edu> wrote:

Hi, Linda—Here are Stuart's questions to create a Banner Code. Please just write in below, email back to me, and I'll send to him.

Thank you!

Beth

Need the following program information:

1. Length of program in years

2. Minimum number of credits required
3. Required semesters (Fall/Spring/Summer/Extension)
4. Is 50% of the program offered at a location other than the home campus.

Question: Would there be a masters or PhD level program that this certificate would be housed under?

Beth Pateman, HSD, MPH
Interim Associate Dean for Academic Affairs
Everly 128
1776 University Avenue
Honolulu, HI 96822
(808) 956-4278 or 7704

----- Forwarded message -----

From: **Stuart Lau** <stuartl@hawaii.edu>
Date: Mon, Dec 18, 2017 at 2:23 PM
Subject: Re: Ethnomathematics Graduate Certificate
To: Beth Pateman <mpateman@hawaii.edu>
Cc: Linda Furuto <lfuruto@hawaii.edu>, "Wendy L. Pearson" <pearsonw@hawaii.edu>

Hi,

Sorry for the delay. Here are the list of questions:

Degree to be awarded: GCER (Graduate Certificate, already exists)

College: 50 (Graduate Division, already exists)

Department: EDCS (Curriculum Studies, already exists)

Field of Study (i.e. major):
Ethnomathematics (new code to be created)

Four-character code to identify major:
Need new code up to four characters in length

Need the following program information:

1. Length of program in years
2. Minimum number of credits required
3. Required semesters (Fall/Spring/Summer/Extension)
4. Is 50% of the program offered at a location other than the home campus.

Question: Would there be a masters or PhD level program that this certificate would be housed under?

Thanks,
Stuart

On Thu, Dec 14, 2017 at 7:36 AM, Beth Pateman <mpateman@hawaii.edu> wrote:

Thanks, Stuart! Let us know and we'll send whatever you need.
Beth

Beth Pateman, HSD, MPH
Interim Associate Dean for Academic Affairs

Everly 128
1776 University Avenue
Honolulu, HI 96822
(808) 956-4278 or 7704

On Thu, Dec 14, 2017 at 7:18 AM, Stuart Lau <stuartl@hawaii.edu> wrote:
Hi.

Please accept my apologies. I do need some additional information. I am currently attending to a couple of other matters and have this on my list of items to do.

Stuart

On Wed, Dec 13, 2017 at 4:01 PM, Beth Pateman <mpateman@hawaii.edu> wrote:

Hi, Stuart—I'm writing to ask whether there's anything you need from us to create a Banner Code for the newly approved Ethnomathematics Graduate Certificate in the Department of Curriculum Studies in COE. Just let us know, and we'll get it done right away.

Thank you!

Beth

Beth Pateman, HSD, MPH
Interim Associate Dean for Academic Affairs
Everly 128
1776 University Avenue
Honolulu, HI 96822
(808) 956-4278 or 7704

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Stuart Lau
University Registrar
Office of the Registrar
University of Hawaii at Manoa
Ph: 808 956-8010

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Stuart Lau
University Registrar
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Linda H.L. Furuto, Ph.D.
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Email: lfuruto@hawaii.edu
Tel: 808-956-3359
Website: <http://www2.hawaii.edu/~lfuruto>



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RECEIVED

17 DEC 1 18:44

November 30, 2017

MEMORANDUMMANOA CHANCELLOR'S
OFFICE

TO: David Lassner
Interim Chancellor

FROM: Michael Bruno
Interim Vice Chancellor for Academic Affairs and
Vice Chancellor for Research

A handwritten signature in black ink, appearing to read 'Michael Bruno'.

SUBJECT: REQUEST TO APPROVE THE GRADUATE CERTIFICATE IN
ETHNOMATHEMATICS

SPECIFIC ACTION REQUESTED:

It is requested that the Chancellor approve the Graduate Certificate in Ethnomathematics to be administered by the Department of Curriculum Studies in the College of Education.

EFFECTIVE DATE:

Summer 2018.

ADDITIONAL COST:

None.

PURPOSE:

The proposed Graduate Certificate in Ethnomathematics is designed to prepare K-12 teachers to transfer culturally sustaining mathematics knowledge to the classroom, school, and district levels.

BACKGROUND:

UH Executive Policy E5.205 grants the Chancellor the authority to approve certificate programs in specific subjects that represent the recognition of work taken within (or among) existing Board-authorized programs.

The proposed Graduate Certificate in Ethnomathematics 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 the College of Education is endeavoring to serve. The College 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 in ethnomathematics in their schools, districts, and communities; and (3) strengthening sustainable campus-community networks leading to college, career, and community readiness.


The cohort-based, 15-credit certificate is designed to serve as a pathway to the MEd in Curriculum Studies, Mathematics Education track and other programs in the College of Education. No new resources are required for the program.

The proposed program has been reviewed and recommended for approval by the Dean of Education, the Office of Graduate Education, the Graduate Council, and the Mānoa Faculty Senate (11/15/17). My staff and I have reviewed the proposal, and we recommend your approval.

ACTION RECOMMENDED:

It is recommended that the Chancellor approve the Graduate Certificate in Ethnomathematics to be administered by the Department of Curriculum Studies in the College of Education.

APPROVED / DISAPPROVED:



David Lassner
Interim Chancellor

DEC - 1 2017

Date

Attachments

- c: Donald Straney, Vice President for Academic Planning and Policy
Dean Young
Dean Aune
Director Iboshi
Chair Halagao
Chair Murata
Registrar Lau
Catalog Coordinator Nakashima
Program Officer Pearson



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Presented to the Mānoa Faculty Senate by the Graduate Council for a vote of the full senate on November 15, 2017, a resolution supporting the proposal for a Graduate Certificate in Ethnomathematics in the College of Education. Approved by the Manoa Faculty Senate on November 15, 2017 with 33 votes in support of approval; 2 votes against; and 2 votes in abstention.

**RESOLUTION SUPPORTING THE PROPOSAL FOR A GRADUATE
CERTIFICATE IN ETHNOMATHEMATICS IN THE COLLEGE OF EDUCATION**

WHEREAS, the purpose of an ethnomathematics graduate certificate is to recruit and prepare high-quality K-12 teachers and transfer culturally sustaining mathematics knowledge to the classroom; and

WHEREAS, the graduate certificate builds on the success of a grant that resulted in development of a yearlong professional development program in ethnomathematics that has been offered for the past four years at the UHM College of Education (COE); and

WHEREAS, the curriculum in the program has been aligned with federal and state standards and the Hawaii Department of Education's *Na Hopena A'o* framework designed to develop skills, behaviors, and dispositions that honor the values of Hawaii's Indigenous language and culture; and

WHEREAS, the ethnomathematics graduate certificate is designed for working professionals, delivered in a cohort model with approximately 20 students over a one year period (Summer-3 credits, Fall- 6 credits, Spring- 6 credits); and

WHEREAS, more than 80 educators from public, public charter, and private schools in Hawaii have participated in this professional development program; and

WHEREAS, acceptance in the ethnomathematics professional development program is competitive with historically three times the number of applicants than can be accepted; and



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WHEREAS, the ethnomathematics graduate certificate is aligned with UH Strategic Directions in becoming a foremost indigenous serving institution and with the mission of the COE to prepare excellent teachers for Hawaii; and

WHEREAS, the certificate has been reviewed and endorsed by the Department of Curriculum Studies, the COE Dean, the COE Committee for Curricular and Program Planning, the COE Senate, the Office of Graduate Education, the Graduate Council, and the Chancellor; therefore

BE IT RESOLVED, that the Mānoa Faculty Senate approves the proposal to establish a Graduate Certificate in Ethnomathematics in the College of Education.

GUIDELINES FOR ACADEMIC SUBJECT CERTIFICATE PROPOSALS

University of Hawai'i at Mānoa Graduate Certificate in Ethnomathematics

- 1. What is the purpose and objectives of the proposed academic subject certificate program, including the relationship to existing degree programs(s), if any?**

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 envision accomplishing 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 ninth 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) 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 four years, the Ethnomathematics Institute transitioned into a yearlong PD program for K–12 educators at UHM where the PI is an Associate 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 from the start, encourage participation by a diverse

group of teachers, and kick-start the certificate in its initial years.

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), and 4.95 (2015–2016). 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 2015–2016.

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 potentially lead into the M.Ed. Curriculum Studies Mathematics Education track, or other COE programs where the department agrees to accept them, as long as the student is concurrently enrolled in the graduate certificate and master’s degree program. 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 master’s degrees (or master’s degree tracks) in mathematics education at any UHS institution.

2. **How will the program be administered? Who will be responsible for advising of students (e.g., department chair, program director or staff, individual faculty from the various participating departments)?**

The ethnomathematics graduate certificate will be administered by the Department of Curriculum Studies. The department will provide a cohort coordinator, whose responsibility will be to guide students’ progress through the program. Faculty members from the COE will advise candidates’ completion of the culminating integrative experience, including those listed below.

3. **What units (e.g., programs, departments, schools, colleges) are involved? Who are the faculty involved in the planning process and who will be involved in implementing the proposed academic subject certificate?**

The planning committee met during the 2016–2017 academic year to discuss learning outcomes, assessment, and other topics. In 2017–2018, we will continue to meet with Hawai’i State Department of Education (HIDOE), Hawai’i Association of Independent Schools (HAIS), and Hawai’i State Teachers Association (HSTA) representatives, who are interested in having their teachers participate in an ethnomathematics graduate certificate. Given the opportunity to pursue the ethnomathematics graduate certificate, we will continue collaborating with HAIS, HIDOE, HSTA, and our network of partners and supporters to market the program.

- Linda Furuto (Chair), Associate Professor, Department of Curriculum Studies
- Andrea Bartlett, Professor and Chair, Department of Curriculum Studies
- Phillippe Galicinao, Mathematics Teacher, Hālaul Kū Māna Public Charter School, HIDOE
- Dewey Gottlieb, State Mathematics Specialist, HIDOE
- Herb Lee, Executive Director, Pacific American Foundation
- Janel Marr, Mathematics/STEM Resource Teacher, Kailua Kalaheo Complex, HIDOE
- Antonina Monkoski-Takamure, Teacher, Iroquois Point Elementary, HIDOE
- Tara O’Neill, Associate Professor, Department of Curriculum Studies
- Joanna Philippoff, Assistant Specialist, Curriculum Research & Development Group
- Susan Saka, Project Evaluator, Curriculum Research & Development Group
- Kaipo Tam, Mathematics Teacher, University Laboratory School, HIDOE
- Nainoa Thompson, President, PVS, and Special Advisor to the President on Hawaiian Affairs,

UHS

- Susan York, Project Evaluator, Curriculum Research & Development Group

The program combines the Department of Curriculum Studies' expertise in curriculum, instruction, and place-based education, particularly as they relate to Hawai'i's schools. 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 Office of Graduate Education, and UHM Chancellor.

4. **What population will be served by the program (e.g., graduate students enrolled in degree programs at the University; professionals working in the community who wish to upgrade knowledge and skills, desire a certificate only, and will not enroll in a degree program; undergraduate students enrolled in degree program at the University (full-time, part-time))? What is the anticipated number of students to be served each year?**

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 is designed for working professionals who desire a certificate only, or it may potentially lead into the M.Ed. Curriculum Studies Mathematics Education track or other COE programs where the department agrees to accept them, as long as the student is concurrently enrolled in the graduate certificate and master's degree program. 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.

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.

5. **How is the program organized?**

- a. **What are the foundation courses and prerequisites needed for acceptance into the program (e.g., graduate or undergraduate status, grade point average; work experience)?**

All applicants must meet Office of Graduate Education admissions standards and documentation 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 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.

- b. **What are the fields of concentration (tracks, areas of specialization) in the program? If there is more than one concentration, how do the fields differ?**
There is only one field of concentration, ethnomathematics.
- c. **What are the number of credits required for the academic subject certificate? (Note that the minimum required credits for graduate and undergraduate academic subject certificates are 15.)**
The number of credits required for the ethnomathematics graduate certificate is 15.
- d. **What courses are required for the certificate program? What is the rationale for including these courses?**

Course Title and Semester	Description/Rationale	Required Course
EDCS 654 Ethnomathematics (3 credits, Summer 2018)	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.	Yes
EDCS 622G Curriculum Leadership: K-14 (3 credits, Fall 2018)	Foundation for critical study of curriculum development and improvement from the perspective of teacher leaders.	Yes
EDCS 653F Mathematics in the Schools: Integrated Math Content (3 credits, Fall 2018)	School mathematics, K-12 content, curricula, pedagogy, and standards; trends and issues; theory and research in integrated math content.	Yes
EDCS 606 Introduction to Research in Curriculum and Teaching (3 credits, Spring 2019)	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 culminating in an outline for Plan B/Thesis proposal.	Yes
EDCS 642G Seminar in Diversity Issues: K-14 (1 credit, Spring 2019)	Examination of principles in multicultural education and diversity.	Yes
EDCS 699 Directed Reading and/or Research (2 credits, Spring 2019)	Individual reading and/or research. Repeatable unlimited times.	Yes

- e. **What is the structure of the program (e.g., first-semester courses; required or core courses; electives)?**
As indicated in the table, the six aforementioned courses are required, and will be completed by all students in the program. One course will be held in Summer 2018 (EDCS 654), two courses will be held in Fall 2018 (EDCS 622, EDCS 653F), and three courses will be held in Spring 2019 (EDCS 606, EDCS 642G, EDCS 699).
- f. **Will a practicum or internship be required for the academic subject certificate? If so, how will the certificate program arrange for and administer the practicum?**
A practicum or internship will not be required for the ethnomathematics graduate certificate.

- g. Is there an integrative experience at the end of the certificate program and if so, of what nature, e.g., scholarly paper, research project, written examination, integrative interdisciplinary seminar?**

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 Mathematics Common Core State Standards and Nā Hopena A'o federal and state standards and benchmarks, with connections to related literature. Students may propose other integrative projects, such as research projects or school improvement plans. A student's advisor must approve alternatives to the Professional Teaching Portfolio.

Throughout the program, course instructors and program advisors will supervise classroom and school-based projects by assessing and providing regular feedback on students' (1) oral reports/presentations, (2) written projects with self-evaluations, and (3) videotapes of 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.

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. Our accreditors value teachers as leaders in mathematics education, so it will also be of benefit in that process.

- 6. What resources are required for program implementation and operation? How will these resources be obtained? Are additional resources required for the operation of the program? Existing faculty will team teach with HIOE and HAIS educators. The program uses existing courses. Qualified students who are not in the program may take the courses if space is available. We expect this program to boost enrollment in master's degree programs. All courses will be offered by UHM. No additional library resources, physical resources, or other resources are needed.**

- 7. How will the effectiveness of the program be demonstrated and measured? How will student learning be assessed?**
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 UHM Advanced Degree Institutional Learning Outcomes, and K-12 standards established by the Interstate Teacher Assessment and Support Consortium and Association of Mathematics Teacher Educators (please refer to Appendices A and B).

Candidates will complete a series of required assessments in the courses. Instructors will score assessments associated with their courses, following well-defined rubrics.

Name Of Assessment	Type or Form of Assessment	When the Assessment is Administered	Standards Addressed
Assessment of content knowledge in license field	Integrative project such as professional teaching portfolio (explained previously)	Throughout the program (particularly EDCS 653F, EDCS 642G, and EDCS 699)	<i>Interstate Teacher Assessment and Support Consortium (InTASC) Standards:</i> InTASC Standards 1-10

			<i>Mathematics Common Core State Standards: Math Practices 1–8</i>
Additional assessment of content knowledge in license field	Collaborative inquiry: curriculum project (group project to design, implement, and assess ethnomathematics curricula in school-based settings)	EDCS 622 and EDCS 654	InTASC Standards 1, 2, 3 Math Practices 1, 2, 3
Additional assessment of content knowledge in license field	Professional development workshop presentation (teacher leaders engage in PD activities at their schools, districts, and/or communities by delivering workshop presentations on ethnomathematics)	EDCS 606	InTASC Standards 6, 7, 8 Math Practices 4, 5
Additional assessment of content knowledge in license field	Additional assessment may include the following: oral reports/presentations, paper proposals outlining topic and preliminary literature reviews, reflections on videotape of classroom experiences, and written projects with self-evaluations.	EDCS 606 and EDCS 654	InTASC Standards 4, 5 Math Practices 6, 7, 8
Additional assessment of content knowledge in license field	Auto-ethnography/framework (analytic essay related to the social, political, educational, epistemological, and historical context of schooling)	EDCS 642G and EDCS 653F	InTASC Standards 9, 10 Math Practices 7, 8

8. Are the program objectives appropriate functions of the college and university? (Applies to proposals for all graduate certificates and for undergraduate certificates that involve units in more than one college or that require the commitment of new resources by the University.) Discuss relationship to University and campus mission and evidence of continuing need for the program.

Program Objectives as a Function of the University

According to the 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

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 (<http://coe.hawaii.edu/about>). 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 Hawai'i State Department of Education 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 four 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 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), International

Congress on Mathematical Education (2016), and Association of Mathematics Teacher Educators (2017). 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).

Appendix A
Interstate Teacher Assessment and Support Consortium (InTASC)

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 Practice

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