Submit originals and one copy and electronic copy to Governance/Faculty Senate Office (email to jharvie@alaska.edu) for electronic copy to jharvie@alaska.edu.

PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR)

SUBMITTED BY:

<table>
<thead>
<tr>
<th>Department</th>
<th>Mathematics and Statistics</th>
<th>College/School</th>
<th>CNSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared by</td>
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<td>Faculty Contact</td>
<td>Ron Barry</td>
</tr>
</tbody>
</table>


PROGRAM IDENTIFICATION:

DEGREE PROGRAM

Graduate Certificate in Statistics

Certificate

Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)

A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)

There are three main changes. First, Calc. I and II constitute enough mathematics background for the certificate, so we are removing the requirement for Calc. III. Second, the combination of MATH371 and MATH408, the upper division undergraduate mathematical statistics and probability sequence is a sufficient substitute for the graduate probability course STAT651 for the purposes of this certificate. Third, allowing any graduate statistics course (or STAT461) to suffice as an elective means we don’t have to list all of these courses separately, which simplifies the program description.

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

1. Complete the following admission requirements:
   1. Hold a baccalaureate degree from an accredited institution
   2. Complete MATH F251X, MATH F252X and MATH F253X or equivalent*
   3. Complete STAT F401 or equivalent*

2. Complete the general university requirements.
3. Complete the graduate certificate requirements.
4. Complete the following:
5. STAT F651--Statistical Theory I--3 credits
6. Complete one of the following options:
   Complete one of the following:
   STAT F652--Statistical Theory II (4)
   or STAT F653--Statistical Theory III (3)--3-4 credits
   Complete two of the following:
   STAT F602--Experimental Design--3 credits
   STAT F605--Spatial Statistics--3 credits
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT F611</td>
<td>Time Series</td>
<td>3</td>
</tr>
<tr>
<td>STAT F621</td>
<td>Distribution-Free Statistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT F631</td>
<td>Categorical Data Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

7. Complete one or more from the following electives to total 12 credits for the certificate:

- STAT F641 -- Bayesian Statistics -- 3 credits
- PHYS F628 -- Digital Time Series Analysis -- 3 credits

8. Complete one or more from the following electives to total 12 credits for the certificate:

- STAT F641 -- Bayesian Statistics -- 3 credits
- PHYS F628 -- Digital Time Series Analysis -- 3 credits
- WLF/FISH F625 -- Analysis of Vertebrate Populations Survival and Movement -- 3 credits

- FISH F601 -- Quantitative Fishery Science -- 3 credits
- ECON F626 -- Econometrics -- 3 credits
- ECON F627 -- Advanced Econometrics -- 3 credits
- ESM F621 -- Operations Research -- 3 credits
- MATH F641 -- Real Analysis -- 4 credits
- MIN/GE F635 -- Geostatistical Ore Reserve Estimation -- 3 credits

9. Minimum credits required -- 12 credits
   * Student must earn a C grade or better in each course.

---

C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:
(Underline new wording, strike through old wording and use complete catalog format)

Complete the following admission requirements:
- Hold a baccalaureate degree from an accredited institution
- Complete MATH F251X, MATH F252X and MATH F253X or equivalent
- Complete STAT F401 or equivalent*

Complete the general university requirements.

Complete the graduate certificate requirements.

Complete the following:

- STAT F651 -- Statistical Theory I -- 3 credits or MATH F408 (Note: STAT F371 is a
  prerequisite for MATH F408)
- Complete one of the following options:
- Complete one of the following:
  - STAT F652 -- Statistical Theory II (4)
  - or STAT F653 -- Statistical Theory III (3) -- 3-4 credits
- Complete two of the following:
  - STAT F602 -- Experimental Design -- 3 credits
  - STAT F605 -- Spatial Statistics -- 3 credits
- STAT F611--Time Series--3 credits
- STAT F621--Distribution-Free Statistics--3 credits
- STAT F631--Categorical Data Analysis--3 credits

6 Complete any two courses chosen from the graduate statistics courses or
   STAT F461 (Applied Multivariate Analysis)
7 Complete one or more from the following electives to total 12 credits for the
   certificate:
   8 Any graduate Statistics course.
   PHYS F628--Digital Time Series Analysis--3 credits
   WLF/FISH F625--Analysis of Vertebrate Populations Survival and Movement--3
   credits
   FISH F601--Quantitative Fishery Science--3 credits
   ECON F626--Econometrics--3 credits
   ECON F627--Advanced Econometrics--3 credits
   ESM F621--Operations Research--3 credits
   MATH F641--Real Analysis--4 credits
   MIN/GE F635--Geostatistical Ore Reserve Estimation--3 credits
   FISH 627--Statistical Computing with R

Minimum credits required--12 credits
* Student must earn a C grade or better in each course.

D. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

There should be little impact. Some students who have taken the undergraduate core statistics and
probability courses won't have to take STAT651. There is a bit more flexibility in the choice of electives.

E. IMPACTS ON PROGRAMS/DEPTS:

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

None.

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)
JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

The original version of the Graduate Certificate was confusing to students and had been pitched as a "half Master's", which was too rigid compared with similar programs at other universities. The revised program is more inviting to students with a mathematics background who may already have taken stat371, math408.
APPROVALS: SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair, Program/Department of:

CNSM

Date

Sept 27, 2016

Signature, Chair, College/School Curriculum Council for:

CNSM

Date

10-2-16

Date

10/6/16
Signature, Dean, College/School of:

[Signature]

CHAIR SIGNATURE OBTAINED FOLLOWING APPROVAL BY FACULTY SENATE COMMITTEE

[Signature, Chair, UAF Faculty Senate
Curriculum Review Committee
Graduate Academic and Advisory Committee]

Date

Text