Evaluation criteria

Program

- **Describe the program type (e.g., certification, two year, four year) and provide the name of the program (e.g., surveying, geomatics). What surveying courses are offered/required in the program?**

The University of Wyoming Cadastral Surveying Certificate is part of the Land Surveying Program and consists of thirty (30) credit hours of land surveying courses. From our course list offerings, they are highlighted in yellow. These classes are provided below with links to course descriptions.

- LS2010 - Engineering Surveying Lecture
- LS2015 - Engineering Surveying Laboratory
- LS2020 - GPS for Land Surveyors
- LS2100 - Records Research for Surveyors
- LS2110 - Real Property Law
- LS2400 - Basic Geodesy for Today's Land Surveyor
- LS2410 - GIS in Surveying
- LS2499 - Sophomore Land Surveying Topics
- LS3100 - Real Property Descriptions
- LS3110 - Boundary Evidence
- LS3120 - Boundary Principles
- LS3130 - Public Land Surveys
- LS3200 - Route Surveying
- LS3210 - Advanced Surveying
- LS3230 - Applied Least Squares Adjustments
- LS3300 - Ethics for the Professional Surveyor
- LS3400 - Remote Sensing/Photogammetry for Surveyors
- LS3500 - Junior Surveying Topics
- LS4110 - Coastal Water Boundaries
- LS4120 - Inland Water Boundaries
- LS4130 - Advanced Public Land Surveys
- LS4500 - Senior Land Surveying Topics

In addition, this Fall we role out a minor in Land Surveying that requires 18 hours of specific course work. This minor includes some of the courses from the Wyoming Board of Professional Engineers and Professional Land Surveyor's education requirements to apply for a Land

Surveyor in Training license. The Land Surveying minor may be paired with any major. The intent of this minor is to prepare the student for the pursuit of Professional Licensure and/or provide a platform for indepth knowledge associated with land surveying.

Curriculum Requirements:

- LS2010 - Engineering Surveying Lecture — Credits 2
- LS3300 - Ethics for the Professional Surveyor — Credits 1

OR

- CE2070 - Engineering Surveying — Credits 3

AND minimum of 15 credits from the following list:

- LS2020 - GPS for Land Surveyors — Credits 4
- LS2100 - Records Research for Surveyors — Credits 3
- LS2110 - Real Property Law — Credits 3
- LS2400 - Basic Geodesy for Today's Land Surveyor — Credits 2
- LS2410 - GIS in Surveying — Credits 3

OR

- GIST2310 - Intro to Geographic Information Systems — Credits 4

- LS3100 - Real Property Descriptions — Credits 2
- LS3110 - Boundary Evidence — Credits 2
- LS3120 - Boundary Principles — Credits 2
- LS3130 - Public Land Surveys — Credits 3
- LS3200 - Route Surveying — Credits 3
- LS3210 - Advanced Surveying — Credits 4
- LS3300 - Ethics for the Professional Surveyor — Credits 1

OR

- MGT3110 - Business Ethics — Credits 3

Total Credits: 18 Hours

- **What is unique about the program compared to other surveying programs?**

From what I can ascertain from researching other programs, we are the largest on-line provider of land surveying courses in the nation. This Spring 2023 semester we had 185 seats filled when classes began in January for the online program and 62 for the on campus, in person course. Students have a mix of synchronous and asynchronous course administration with licensed instructors from industry at the helm. The education for the academic leg of licensure is 100% online and designed for the working professional. In addition, there is an on campus class (CE2070 Engineering Surveying) that include labs for hands-on experience for students.

What makes this unique is that the UW program is friendly to those who are already working as surveyors or in other fields but who wish to license in surveying. Students that take our courses have included professional architects, engineers, and land entrymen who want to achieve

licensure in land surveying. Other students in these same classes may not have surveyed at all and are just starting out. This diversity is really valuable for the students and teachers, bringing some experience to the virtual classroom from different backgrounds, points of view and different states so that a broader range of information is available to the students.

The on line classes are also very flexible, meeting the needs of the students. We have had students who were displaced by hurricanes and/or tornadoes during the semester and unable to keep to the schedule. Our class setup allows for individual attention and flexibility so that they can complete coursework as they are able to return to their lives. Recently, there have been some cases of COVID that we have adjusted the coursework to accommodate without it imposing on the rest of the students as it might in a classroom setting with a more structured schedule.

- **What are the qualifications of the instructors? How many are full-time? Adjunct?**

The program consists of two full-time instructors (Macy, Mouland) and several part-time instructors. Part-time instructors are selected based on their qualifications and expertise in the particular subject. This includes academic credentials, professional experience, licensure, and online teaching experience or abilities.
The University of Wyoming follows the standards for "Faculty Roles and Qualifications" set forth by the Higher Learning Commission (HLC). These standards say:

> *Qualified faculty members are identified primarily by credentials, but other factors, including but not limited to equivalent experience, may be considered by the institution in determining whether a faculty member is qualified.… When faculty members are employed based on equivalent experience, the institution defines a minimum threshold of experience and an evaluation process that is used in the appointment process.*

Since the program is administered by the Department of Civil and Architectural Engineering and Construction Management, the Department Head (Denzer) is responsible for hiring part-time instructors and determining their qualifications. The Department Head is also responsible for reviewing their performance, including administering student course evaluations each term and reviewing these responses.
All instructors in the UW Land Surveying program are well-qualified for their teaching assignments based on academic credentials, professional experience, licensure, and teaching experience. All part-time instructors in the UW Land Surveying program hold the PLS licensure, with the exception of one instructor who is a licensed attorney. All are regularly reviewed in their performance and all are 'meeting expectations' or better.
The UW Land Surveying program Is fortunate to have a stable and loyal team of part-time instructors. All have been teaching for the program for several years, and we regard this continuity as a major strength of the program.

- **Is the program accredited? If so, by what commission or association?**

The on campus course, CE2070 Engineering Surveying, is a four credit hour course including an associated laboratory. Successful completion is required for students in either the ABET accredited Civil Engineering Bachelor Degree and the ACEC accredited Construction Management Bachelor Degree programs here at the University of Wyoming.

- **What surveying tools, equipment, and technologies are used to teach students?**

TopCon AT-B2 automatic levels (6), ES52 Total Station (6), HiPer V positioning system (4), and FC-500 field controllers (6), TP-10 heavy duty tripods (16), Seco standard prisms (6), Leica 360 degree rotating robotic prisms (2), Leica iCR50 Robotic Total Station (negotiating for 2 with tablets and software (1 surveying package, 1 construction management package)

- **How does the program remain current with surveying technology?**

The instructors are up to date with current technology via continuing education mechanisms required for their professional land surveying license and on campus professional engineering license. All instructors have significant experience in the field and/or owners or their own firms. The significant majority of students are working in the industry, on current projects, with today's technology.

Student outcomes

- **What is the primary learning objective for the program?**

To prepare students to take the professional exams in their jurisdictions to pursue licensing.

- **What are the student outcomes, and how are they assessed? Are surveying internships incorporated into your program?**

These are academic courses with an applied US grading scale based upon 4.0 system. Outcomes are measured with weighted scores associated with reports, discussions, exams, quizzes, and field work. Surveying internships are not allowed for substitution of academic credit in land surveying. This is done intentionally to follow the professional practice statutes to keep experience and education as separate legs of licensing.

- **Are students engaged in assignments or projects that involve real-world application?**

Yes. Work is derived from application of instructor experiences in industry.

- **Are instructors and/or students involved in research and development activities? Provide brief examples**.

Instructors and/or students in the program are not part of the R&D activities with the University since this program is 100% online. This program is specifically not traditional academia and is industry based with specific goals to serve licensing pathway students.

Student involvement

- **Are students active in surveying clubs and professional associations? What activities do they do?**

Students are encouraged to be active in their professional associations, both within their jurisdictions and communities, and nationally. The activities are not part of the academic curriculum so they are not a measured outcome.

- **Have students participated in any surveying competitions in the last two academic years?**

Current students in the CE program took part in the LS competition this past semester after completing the on campus CE2070 Engineering Surveying course.

- **Are students engaged in community service projects? If so, briefly describe them, differentiating nontechnical humanitarian projects from those that are tied to the curriculum or that required the use of surveying skills**

Students are encouraged to be active in their communities as we have specialized knowledge that can benefit citizens in life/safety arenas. Such activities are not part of the academic curriculum so they are not a measured outcome.

Outreach/recruitment

- **How, and from where, does the program recruit students?**

Most students are referrals from licensing boards across the nation and/or former students who want their employees to have the same courses/instructors. We also actively market online and locally via Engineers Week, Surveyors Week, Wyoming Board of Professional Engineers & Surveyors, with student engagement K-12.

- **What are the enrollment numbers for the program for the past three years?**

Academic years
Fall 2020-Spring 2021: 353 total (279 online)
Fall 2021-Spring 2022: 336 total (265 online)
Fall 2022-Spring 2023: 417 total (299 online)

- **Are external licensed surveyors involved in the program? If so, how?**

The instructors are licensed surveyors with the exception of the on campus course which is taught by a licensed engineer and real property law which is taught by a licensed attorney.

- **Does the program seek assistance or support from external associations, societies, or firms?**

Yes, although since it's inception, the first donation to the program was made this last Fall. It was $1000 and is the only donation or contribution on record for the land surveying program. More often, local professionals will offer their time over a monetary donation.

- **What efforts have been made to grow the program? What efforts are planned for the future?**

We expanded the program to include an 18-hour minor to be available this Fall 2023 semester that is designed to attract a more traditional student to take more LS courses. This was done to accommodate students in CE and CM that expressed an interest in advancing their skills and knowledge for employment in their careers, but did not have the time for the full 30 hour certificate within the four year bachelor degree programs they were pursuing.

- **Does your program have marketing materials for outreach/recruitment purposes? If so, please include with the submittal.**

The links to the online program are provided below:

https://www.uwyo.edu/stateauth/licensure-certification/land-surveying-certification.html

http://www.uwyo.edu/uw/degree-programs/land-surveying-certificate.html

http://www.uwyo.edu/fsbo/student-financial-services/tuition-and-fees.html

There is a reduced tuition rate, regardless of residency, for LS students. This is done to promote licensure across the nation.

Licensure

- **How is professional licensure promoted to students?**

The literature all promote licensure by referencing the local jurisdiction, Wyoming Board of Professional Engineers and Professional Surveyors, in all publications and promotions for the program. In addition, all instructors are from industry and licensed professionals. The very existence of the program is built upon the premise that students are seeking professional licensure.

- **Are students encouraged or required to take the FS exam before graduation? What support is given to them?**

Many students have contact with their local jurisdiction's board staff and are being supported by faculty to pursue their licensure dreams via the three legs of academic coursework, experience and examination.

- **How many and what percentage of students take and pass the FS exam before graduation?**
- **How do you track if students attain licensure post-graduation? Provide data if available.**

This is not something we currently track, however, it is something that we could survey students with and begin tracking. At the present time we do not have mechanisms in place to measure these types of metrics.

Summary/benefits/merits (essay format)

- **Why should the program receive this award?**
- **How would this award, if received, benefit the program?**
- **How will this award, if received, advance professional licensure for surveyors and promote the surveying profession?**

The University of Wyoming Cadastral Surveying Certificate Program was created over a decade ago to specifically support professionals seeking professional licensure. The very design of the courses, credit hours and content, were done with the active participation and approval of the Wyoming Board of Professional Engineers and Professional Surveyors. The intent is to provide a mechanism for working professionals across the nation to have access to a self-paced education to prepare for a career in the land surveying arena.

We recently, and unexpectedly tragically lost an instructor. He taught two of our advanced LS courses and one preparatory CE class. This exposed our vulnerability as we scrambled to find an LS to step into the role for the second half of the course. Luckily, the previous Director of the Land Surveying Program for UW, was available and able to step in and take over the class. We do not have a large pool of instructors to draw from that are willing and able to step into these academic roles. Half our adjunct instructors are certified federal licensed surveyors as well as professional surveyors in their jurisdictions. In order to continue to provide a quality program that can run seamlessly is to add 2-3 more licensed professional surveyors as instructors. Hiring multiple adjunct can be more expensive than a full time instructor.

Funding would be used to hire additional instructors and market the program to a broader audience. The award would be seed money to grow the program and for it to remain self-sustaining. The only way to get this program to be expanded into a bachelor degree program, would be to prove to this research institution its vitality. External support shows and proves the relevance of what the instructors and staff in the UW Land Surveying Program do for industry. We could implement a metrics tracking system to evaluate the number of people taking our classes who ultimately become licensed. This would be good information to gather and understand.

The heart of this program is designed to advance the education of people seeking professional surveying licensure. With such a high enrollment, we can continue to serve the nontraditional student and arm them with the information necessary to further their careers. The net effect would be an increase in the number of licensed people available to serve people's needs. These individuals would be ready to work in industry and protect the public's health, property and welfare.