

University of Alaska Board of Regents
Program Approval Summary Form

MAU: University of Alaska Anchorage
Title: Graduate Certificate in Earthquake Engineering

Target admission date: **Fall 2009**

How does the program relate to the Education mission of the University of Alaska and the MAU?

Who promoted and developed this program

The program was developed by the UAA engineering faculty after interaction with local practicing engineers to obtain the engineering community's specific needs in the field of earthquake resistant structural design.

What Development process was followed (inside and outside UAA)

The Alaska Seismic Hazards Safety Commission has recommended proper assessment of structural stability of critical facilities in the state and adequate seismic risk mitigation for future building constructions. The proposed graduate certificate has been designed with the assistance of the Alaskan engineering community to educate engineers to undertake challenging tasks in developing proper seismic designs that address the effects of ground failure, ground shaking amplification, and structural response. This certificate additionally takes advantage of a state-of-the-art seismic network consisting of ground, boreholes and structural sensors in Anchorage area established by the U. S. Geological Survey in collaboration with the University of Alaska.

Impact on existing programs statewide, and on GERs

The proposed Graduate Certificate will provide the practicing engineers a professional qualification that will ensure understanding and proper application of earthquake-resistant design procedures to structures. The credential will make the engineers more qualified and competitive in undertaking challenging tasks for active seismic zones of the United States. The proposed graduate certificate should enhance the existing graduate civil engineering program at UAA. Being a graduate certificate, it will not have any impact on the institutional GERs.

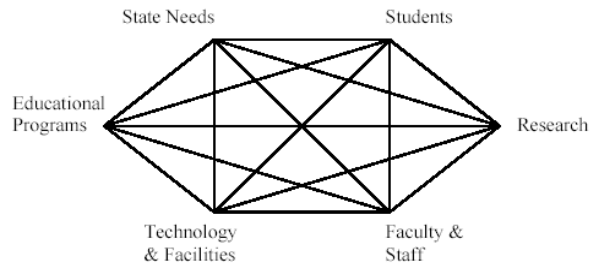
What State Needs met by this program.

The existing undergraduate and graduate degree programs in civil engineering at UAA are broad in scope with limited capacity to emphasize earthquake aspects of structural design those are of prime local importance. The proposed graduate certificate program in earthquake engineering has been formulated in such a way that it provides adequate training to engineering professionals for safe design of structures in the State of Alaska and elsewhere. It is the intent of the School of Engineering that this certificate becomes a standard qualification in future for those who regularly practice the structural design in Alaska.

What are the Student opportunities and outcomes? Enrollment projections?

Abilities to:

- Evaluate the recorded seismograms, perform site response and ground motion parameter estimation.
- Analyze earthquake characteristics and associated effects on structures, including linear and nonlinear responses.
- Apply the basic principles for seismic design and construction of structures in accordance with the provisions of International Building Codes.
- Understand the concepts of dynamic equation of motions and perform analysis for dynamic systems in civil engineering applications.



- Evaluate dynamic soil properties; analyze ground response and soil-structure interaction effects, and other geotechnical engineering problems.
- Evaluate the magnitude and distribution of seismic and other probable loads for strength/stress design and load-resistant factor design.

Enrollment projections

The availability of the certificate is expected to increase these enrollments to a stable average enrollment of 10 students in each class. An average 10 certificates per year are projected to be awarded after the second year the certificate is officially available.

Describe Research opportunities:

Students pursuing the Graduate Certificate may be inspired to continue their education and participate in research toward a Master of Science in Civil Engineering or in Arctic Engineering. The UAA School of Engineering has active research group in geotechnical and civil engineering. Most of the research involves the use of equipment currently available in School of Engineering including range of associated apparatus, equipment, and data analysis software.

Describe Fiscal Plan for development and implementation:

Expenses and Revenues. Sources and plans to meet expenses

Table 1 provides the expenses and tuition revenue for the program. Existing faculty and currently approved courses are used in the degree. The faculty cost figures in Table 1 represent either reassignment or currently assigned faculty workloads associated with the courses that are a part of the proposed certificate program. The estimated tuition revenue represents the tuition obtained from increased enrollments of existing courses.

Table 1 : Expenses and Revenues

Description	FY2009	FY2010	FY2011	FY2012
2 Full-time Engineering Faculty (20% each)	\$35,900	\$36,980	\$38,090	\$39,230
Estimated Tuition Revenue for Program	\$36,120	\$37,930	\$39,820	\$41,810
Net Program Revenue	\$220	\$950	\$1730	\$2580

Faculty and Staff

T. Bart Quimby, PE, Ph.D., Professor, Department of Civil Engineering, UAA

He Liu, PE, Ph.D., Professor, Department of Civil Engineering, UAA

Zhaohui (Joey) Yang, Ph.D., Assistant Professor, Department of Civil Engineering, UAA

Utpal Dutta, Ph.D., Associate Professor, Department of Civil Engineering, UAA

Technologies, Facilities and Equipments

The certificate program will be delivered on the main UAA campus using existing classrooms, laboratories, and equipment. No new facilities will be required for the program. All the students have access to the full suite of library services, many of which are available on line (see: <http://www.lib.uaa.alaska.edu/>). Engineering graduate students have access to publications on research and practice by Ingenta Connect and other journal abstract services through the UAA Consortium Library. Copies of journal articles not on library shelves are available within a few days as email attachments through Interlibrary Loan Service.

Indirect costs to other units (e.g. GERs)

No cost involvement is anticipated for other units.