

NEW OCCUPATIONAL ENDORSEMENT REQUEST
(UA Regulation 10.04.02)

Mining Mill Operations
Occupational Endorsement

Submitted by
Division of Process Technology
Community & Technical College
College of Rural and Community Development
Process Technology Programs
University of Alaska-Fairbanks

August 2015

I. Cover Memorandum should include:

A. The following faculty participated in preparing these documents (**CTC Process Technology & UAF Mining Engineering**)

Brian Ellingson
Associate Professor, CTC Process Technology Programs
CTC Process Technology Coordinator

Tathagata Ghosh
Assistant Professor
UAF Mining and Geological Engineering

Keith Swarner
Associate Dean, CTC

Rajive Ganguli
Department Chair, UAF Mining and Geological Engineering
Professor, Mining Engineering

B. Brief statement of the proposed endorsement, industry objectives and abbreviated student learning outcomes assessment and implementation plan.

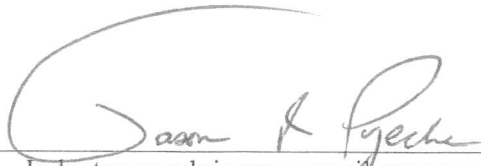
1. Statement of the proposed endorsement

The proposed Occupational Endorsement will be designed as a three to four month training program that will consist of a minimum of 17 credits of coursework. This design will provide a program that is short in duration, focused on the skills and knowledge of a mill operator, and be eligible for students to receive financial aid while completing the program. Completion of the program will result in students being awarded an Occupational Endorsement (OE) credential in Mining Mill Operations. The program will be delivered cooperatively by faculty from Process Technology program at UAF's Community and Technical College and the UAF's Department of Mining and Geological Engineering.

2. Industry objectives

This proposal is to develop a Mining Mill Operations program at the University of Alaska Fairbanks. The purpose of this program will be to train and prepare an Alaskan workforce to meet the increasing demand for mill operators in Alaska's mining industry. The mill operator occupation has been identified by Alaska's mining industry as a high priority occupation and is projected to grow from 28 to 112 mill operators between 2014 and 2022. Currently no programs exist within the state of Alaska to train students for this specific occupation.


C. Provision for review signatures of preparation:


Industry or advisory council representative

11/17/2015
Date


Program head responsible for the transcription request and completion checklist

11/16/2015
Date


Dean of school/college housing the occupational endorsement

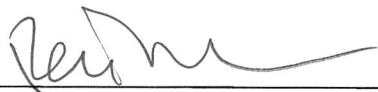
12/10/15
Date



UAF Community & Technical College Academic Council

12/09/15
Date

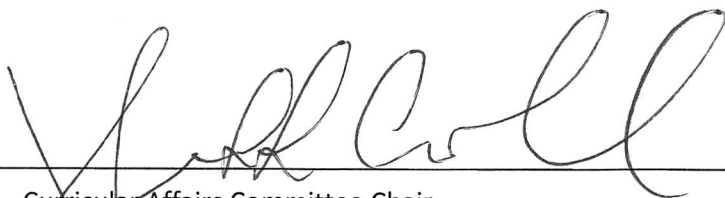
Signatures for approval (continued):



Curriculum Review Committee Chair

29 Jan 2018

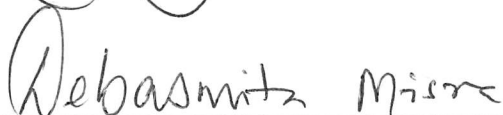
Date



Curricular Affairs Committee Chair

2/3/16

Date



President, UAF Faculty Senate

1/26/16

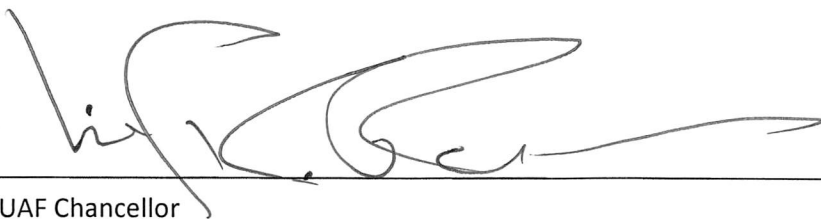
Date



UAF Provost

2/10/16

Date



UAF Chancellor

2/12/16

Date

II. Identification of the Endorsement (All pages should be numbered.)

A. Description of the Occupational Endorsement

1. Occupational Endorsement in Mining Mill Operations
2. Admissions requirements and prerequisites
 - i. Document high school diploma or GED
3. Course descriptions of required catalogue courses.

PRT 110 3 credits

Introduction to Occupational Safety, Health and Environmental Awareness

Overview of the field of safety, health and environment within the process industry. Covers plant hazards, safety, and environmental systems and equipment, and applicable government regulations and industry standards. (3+0)

PRT 140 3 credits

Industrial Process Instrumentation I

Physics of pressure, temperature, level and flow measurement; mechanical and electrical aspects of instruments used to control dynamics of processes. Dynamics of automatic control including proportional control, automatic reset, derivative action and integral timing. *Prerequisites: DEVM F105 or higher or permission of instructor.* (2+2)

AMIT 129 1 credit

Surface Mine Safety

Rights of miners, introduction to the work environment, ground control, hazard recognition, first aid and explosive safety. Course fulfills the Mine Safety Health Administration requirements for surface miner training. Students are awarded MSHA certificate upon completion of the class. (1+0)

AMIT F130 3 credits

Surface Mining Operations

Safe operations of a surface mine and plant. Placer gold, sand and gravel, coal, and open pit metal mines and processing plant. (3+0)

AMIT 135 4 credits

Introduction to Mining Systems and Equipment

An overview to the field of mining beneficiation and comminution, systems and equipment used for the mining and mineral processing industry. Fundamentals of basic separation and mineral beneficiation of surface and underground mining, economic planning, environmental concerns, safety and terminology will be explored. (3+3)

AMIT 145 3 credits

Introduction to Mineral Beneficiation

Provides an overview or introduction into the field of mineral beneficiation and comminution, systems and equipment used for the mineral processing industry. Fundamentals of basic separation and mineral beneficiation, environmental concerns, safety and terminology will be explored. (3+0)

4. Requirements for the endorsement.
 a. Include a sample course of study and a 3-Year Cycle of course offerings.

Course of Study		
Semester	Full Time/Cohort Student	Part Time Student
1 st semester (Summer)	PRT 110 (3) PRT 140 (3) AMIT 135 (4) AMIT 145 (3) AMIT 129 (1) AMIT 130 (3)	AMIT 129 (1) AMIT 130 (3) AMIT 135 (4) AMIT 145 (3)
2 nd semester (Fall) normally offered		PRT 110 (3)
3 rd semester (Spring) normally offered		PRT 140 (3)

3 Year Cycle									
Course	Spr16	Fall16	Summer 16	Spr17	Fall17	Summer 17	Spr18	Fall18	Summer 18
PRT 110		X	X		X	X		X	X
PRT 140	X		X	X		X	X		X
AMIT 129			X			X			X
AMIT 130			X			X			X
AMIT 135			X			X			X
AMIT 145			X			X			X

- b. Include a proposed general catalog layout copy of the endorsement with short descriptive paragraph.

Process Technology

Occupational Endorsement: Mining Mill Operations

The Occupational Endorsement in Mining Mill Operations provides education and training in the skills and knowledge required of a mining mill operator.

This program is open to those who have a high school diploma or GED.

1. Complete the following courses:

PRT 110 – Introduction to Occupational Safety (3)

PRT 140 – Industrial Process Instrumentation I (3)

AMIT 129 – Surface Mine Safety (1)

AMIT 130 – Surface Mining Operations (3)

AMIT 135 – Introduction to Mining Systems and Equipment (4)

AMIT 145 – Introduction to Mineral Beneficiation (3)

Minimum requirements for the endorsement (17)

B. Endorsement Goals

1. Brief identification of objectives and subsequent means for their evaluation

The objectives of the Mining Mill Operations Occupational Endorsement are to:

- enhance employability and skills needed to work as a Mill Operator in Alaska's large scale mines, and
- provide an additional pathway into the Process Technology A.A.S. degree for students whose goal is to work in the mining industry and develop advanced knowledge and skills

These objectives will be measured by tracking the following metrics:

- Number of completers working in mill operations within the mining industry
- Number OE completers who also earn an AAS in Process Technology
- Number of OE graduates progressing (enrolling) in a higher degree

2. Relationship of endorsement objectives to industry needs

The purpose of this program will be to train and prepare an Alaskan workforce to meet the increasing demand for mill operators in Alaska's mining industry. The mill operator occupation has been identified by Alaska's mining industry as a high priority occupation and is projected to grow from 28 to 112 mill operators between 2014 and 2022. Currently no programs exist within the state of Alaska to train students for this specific occupation.

3. Occupational/other competencies to be achieved

Students who earn the Mill Operator Occupational Endorsement will have the skills and knowledge required to work effectively in the following areas of mill operations:

Occupational and Mine Safety

Students will learn to work safely in a mill environment; how to properly and safely transport dangerous goods; how to identify and work safely around power line hazards; and how to utilize fall protection systems and equipment. Students will develop knowledge related to the Mine Safety Health Administration (MSHA) requirements for mine and mill safety.

Industrial Process Instrumentation

Students will learn the basics of programmable logic controllers and instrumentation operation.

Mining Systems and Equipment

Students will develop skills and knowledge related to hand and power tools used in mill operations; lifting devices; ladders and scaffolds; sump pump operations; service vehicles and equipment, and general mill operations.

Mill Operations and Processes

Students will learn processing basics, including, conveying, crushing, grinding, classification, gravity separation, dewatering, extraction, physical and chemical processes, hydromet/pyromet, tailings disposition, and sampling and testing.

4. Relationship of courses to the endorsement objectives

The courses to be completed within the occupational endorsement speak directly to the specific skills and knowledge required for mining mill operators. The courses also provide a foundation for the students to enter more advanced training.

- C. Describe Student Learning Outcomes Assessment Plan, and identify the individual (by position) who will be responsible for directing its implementation.

Intended Outcomes	Assessment Criteria and Procedures	Implementation
<p>The graduates of the CTC-UAF Mining Mill Operations OE program will be able to:</p> <p>Describe the importance of maintaining a safe workplace and safe operations.</p> <p>Describe compliance with regulatory requirements and engineering limits.</p> <p>Describe how process variables are measured and controlled.</p> <p>Describe the equipment and systems used in mineral beneficiation and comminution.</p> <p>Describe the basic fundamentals of mineral beneficiation and separation.</p> <p>Demonstrate basic operation procedures of a mill operation system.</p>	<p>Specific test question results from PRT 110, PRT 140, AMIT 129, AMIT 130, AMIT 135, AMIT 145 are compiled and evaluated across all students by subject area.</p> <p>In addition to these scores, key skill evaluations will be compiled from each of these courses to determine an overall rating for student demonstrated performance.</p>	<p>PRT Program Coordinator- Review results annually with PRT and MinGeo faculty group to determine results and recommendations. Document and share overall results and continuous improvement recommendations.</p>

III. Personnel Directly Involved with Program

- A. List current faculty teaching the required and elective courses and titles, including brief statement of duties and qualifications

Instructional Staff

Brian Ellingson
Process Technology Program Coordinator
Associate Professor of Process Technology
Teach PRT 110 Introduction to Occupational Safety, PRT 140 Industrial Instrumentation I,
Advise students in the Mill Operator Occupational Endorsement Program

Tathagata Ghosh
Assistant Professor
Mining and Geological Engineering
Teach Mining Engineering courses and advising mining students

Guven Akdogan
Associate Research Professor
Institute of Northern Engineering
Teach Mineral Processing courses

Adjunct Faculty will be hired to teach courses in the curriculum. Qualifications vary according to the course.

- B. Administrative, coordinating and classified staff personnel associated with the endorsement

Brian Ellingson
Process Technology Program Coordinator, CTC
Associate Professor of Process Technology
Recruit students, develop partnerships with industry in Alaska, advise students, oversee quality of program, maintain records for Student Outcomes, perform program assessment, identify adjunct faculty, schedule classes, coordinate with CTC and Mining Engineering.

Tathagata Ghosh
Assistant Professor
Mining and Geological Engineering, CEM UAF
Recruit students, develop partnerships with industry in Alaska, advise students, oversee quality of program, identify adjunct faculty, schedule classes, coordinate with CTC and Mining Engineering.

Rajive Ganguli
Department Chair, Mining and Geological Engineering
Professor, Mining Engineering
Develop partnerships with industry in Alaska, oversee quality of program, Grant PI for Mill Operator OE project.

Guven Akdogan
Associate Research Professor
Institute of Northern Engineering

Teach courses and other instructional activities

Keith Swarner

Associate Dean, CTC

Evaluate faculty and staff, oversee quality of program, make decisions with regard to resource allocation.

Michele Stalder

Dean, CTC

Evaluate faculty and staff, oversee quality of program, make decisions with regard to resource allocation.

IV. Enrollment Information

A. Projected enrollment

We project an enrollment of approximately 10-20 students from across the state annually.

B. How determined/who surveyed/how surveyed

Projections are based on our experience with the Process Technology and related certificate programs over the past 5 years, and from industry projections of job growth and vacancies. The mill operator occupation has been identified by Alaska's mining industry as a high priority occupation and is projected to grow from 28 to 112 mill operators between 2014 and 2022.

Currently no program exists within the state of Alaska to train students for this specific occupation.

C. Maximum enrollment which endorsement can accommodate (endorsement capacity)

Classes will typically allow a maximum of 20 students. This provides a reasonable instructor/student ratio for the hands-on and lab portions of the instruction.

The endorsement will be completed by students in a cohort arrangement, with a maximum of 20 in each cohort.

V. Need for Occupational Endorsement

A. Employment market needs:

1. Who surveyed? How? (Standard procedures with industry/advisory council listed)

The Alaskan mining industry typically has difficulty in filling positions because of geography, turnover (up to 20%), local hire commitments and shortage of some skills. Combined with the projections of higher need, the outlook for mining industry jobs in Alaska is very good. This is according to the "needs" assessment released by the Alaska Miners Association (AMA) HR/WFDC in March, 2014.

2. Job opportunities now, and two, five, and ten years from now. How were these predictions determined? (Local, regional, State surveys, periodic review will ensure the currency.)

This table, from the “needs” assessment released by the Alaska Miners Association (AMA) HR/WFDC in March, 2014, shows the projected job growth in the mining industry (broken down between attrition and new positions).

	2014	2015	2016	2017	2018	2019	2020	2021	2022
NEW	135	166	195	10-20	500	300	1000	300	1000
ATT	116	121	133	135	130	131	156	170	219
TOTAL	251	287	328	155	630	421	1156	470	1219

A partial list of the breakdown in the job growth is as follows:

	2014-15	2016-2017	2018-2019`	2020-2022 + new only
Mill Operators	28	20	71	112
Haulers / Equip Operator	148	96	232	421
UG Miners	27	34	20	60
Mill/Mechanic	17	20	32	72
Equip Maintenance	31	28	94	223

Not included in the above data are new mines that are at various stages of development. If some of these mines come online, there may be as many as 3,000 additional jobs.

3. How have positions been filled to date?

The mining industry has traditionally hired entry level employees into low level positions and promoted people into mill operator positions if they showed potential.

VI. Other

Any justification for the endorsement, which might not fit under III and IV above.

This program provides students the opportunity to achieve short-term academic success while working toward long-term academic goals. This program provides a pathway to higher education, while creating a qualified pool of Alaska workers to fill positions in Alaska's mining industry.

VII. Relation of Endorsement to other Programs within the System

Mining is a process industry and is therefore directly related to the Process Technology program. The courses proposed for this OE are all pre-existing courses and can all be used to satisfy degree requirement for the Process Technology A.A.S. degree. This OE has been designed to allow students who want to continue their education with more advanced coursework to do so, and earn an A.A.S. in Process Technology.

Currently, the Applied Mining Technologies (AMIT) certificate program is suspended, with the courses being reserved for future use.

VIII. Implementation/Termination

A. Date of implementation

Courses are already in place. Implementation of the occupational endorsement will begin June 2016.

B. Plans for recruiting students

- Engage with DOLWD agencies that cater to unemployed
- Visit high schools
- Create promotional material on Mill Operator OE program
- Marketing programs to enhance outreach efforts

C. Plans for phasing out endorsement if it proves unsuccessful

An employer survey, especially if placement is low, may indicate why the Mill Operator OE may be unsuccessful. If the market data is wrong or has changed, or a sufficient number of new students is not achieved, we will phase out the OE. No new students will be admitted after the determination has been made.

D. Assessment of the endorsement. (Include a Student Outcomes Assessment Plan.)

Mining Mill Operations OE Assessment Plan

Intended Outcomes	Assessment Criteria and Procedures	Implementation
Students will gain employment, be promoted, or get a raise.	5-15 students obtain employment or promotion We will survey graduates yearly in the fall, for the first 2 years after their completion of the Occupational Endorsement in Mining Mill Operations.	The survey will be prepared during Fall 2016, and will be administered each fall thereafter. Results reviewed by the department and feedback discussed for improvements to program. (PRT program coordinator)
Number of OE completers per year Number of Process Technology students who add OE	10-20 OE completers per year 1-5 Process Technology students complete OE	Review total students vs completers to document success rate. Discuss/implement improvements if ratio appears to low. (PRT program coordinator)
Number of OE graduates progressing (enrolling) in a higher degree	1-5 OE completers enroll in a higher degree	Track students through the UA system, or from survey results to determine number enrolling in a higher degree. (PRT program coordinator)