SUBMITTED BY:

<table>
<thead>
<tr>
<th>Department</th>
<th>Mining &amp; Geological Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared by</td>
<td>Sukumar Bandopadhyay</td>
</tr>
<tr>
<td>Email/Contact</td>
<td><a href="mailto:sbandopadhyay@alaska.edu">sbandopadhyay@alaska.edu</a></td>
</tr>
</tbody>
</table>

1. ACTION DESIRED
   (CHECK ONE):
   - Trial Course
   - New Course

2. COURSE IDENTIFICATION:
   - Dept: MIN
   - Course #: 445/645
   - No. of Credits: 3
   - MIN 302 as pre-req & Min 454 concurrently

3. PROPOSED COURSE TITLE:
   Accidents, Emergency & Safety Management in Mines

4. CROSS LISTED?
   - NO
   - If yes, Dept:
   - Course #:
   (Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

5. STACKED?
   - YES
   - If yes, Dept: MIN
   - Course #: 645

6. FREQUENCY OF OFFERING:
   - Alternate Fall
   (Every or Alternate) Fall, Spring, Summer - or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (if approved): Fall 2013

8. COURSE FORMAT:
   NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.
   - COURSE FORMAT:
     (check one)
     - 1
     - 2
     - 3
     - 4
     - 5
     - XX 6 weeks to full semester
   - OTHER FORMAT (specify)
     Mode of delivery (specify lecture, field trips, labs, etc)
     Lectures

9. CONTACT HOURS PER WEEK:
   - 3 LECTURE hours/week
   - 0 LAB hours/week
   - PRACTICUM hours/week
   Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See http://www.uaf.edu/uafgov/faculty/cd/credits.html for more information on number of credits.
   - OTHER HOURS (specify type)
10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):


SEE NEXT PAGE FOR MIN F645 course description.

11. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)
H = Humanities  N = Natural Science  S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core?  YES ☒ NO

IF YES, check which core requirements it could be used to fulfill:

G = Oral Intensive,  W = Writing Intensive,
Format 6  Format 7  Natural Science, Format 8

12. COURSE REPEATABILITY:
Is this course repeatable for credit?  YES ☒ NO

Justification: Indicate why the course can be repeated
(for example, the course follows a different theme each time).

How many times may the course be repeated for credit?

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?

13. GRADING SYSTEM:
LETTER ☒ XX  PASS/FAIL: ☒

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES
MIN 302, or equivalent, Min 454 concurrently, or permission of the instructor

RECOMMENDED
Internship in coal or metal mines or prior mining industry experience

Classes, etc. that student is strongly encouraged to complete prior to this course.

15. SPECIAL RESTRICTIONS, CONDITIONS

16. PROPOSED COURSE FEES $☐

Has a memo been submitted through your dean to the Provost & VCAS for fee approval? Yes/No

17. PREVIOUS HISTORY
Has the course been offered as special topics or trial course previously? Yes/No

If yes, give semester, year, course #, etc.: ☒
10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):

Prerequisites: MIN F302 or equivalent, graduate standing, or permission of instructor.

11. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities
N = Natural Science
S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? YES XX NO
IF YES, check which core requirements it could be used to fulfill:
O = Oral Intensive, W = Writing Intensive, Natural Science, Format 6
Format 7
Format 8

12. COURSE REPEATABILITY:

Is this course repeatable for credit? YES XX NO

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit? TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? CREDIT

13. GRADING SYSTEM:

LETTER XX PASS/FAIL:

14. PREREQUISITES

MIN 302 or equivalent, graduate standing or permission of the instructor

RECOMMENDED

Internship in coal or metal mines or prior mining industry experience

15. SPECIAL RESTRICTIONS, CONDITIONS

16. PROPOSED COURSE FEES $____

Has a memo been submitted through your dean to the Provost & VCAS for fee approval? Yes/No

17. PREVIOUS HISTORY

Has the course been offered as special topics or trial course previously? Yes/No

If yes, give semester, year, course #, etc.:
18. ESTIMATED IMPACT
WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

None

19. LIBRARY COLLECTIONS
Have you contacted the library collection development officer (ffk1j@uaf.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No [X] Yes [ ] Adequate resources are available in the Department Library

20. 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

21. POSITIVE AND NEGATIVE IMPACTS
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

None

JUSTIFICATION FOR ACTION REQUESTED
The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course 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. Use as much space as needed to fully justify the proposed course.

In today’s mining industry, all levels of management understand the moral obligation, as well as economic justification, for running operations in a manner that safeguards the health and safety of their workers. These factors, coupled with the enforcement liabilities attached to the ever increasing maze of state and federal regulations, requires mining engineers to be experienced in health and safety issues. To address this development, it is incumbent upon mining engineering programs to prepare students to accept and professionally prepared for these duties.

Safety professionals and progressive mining companies know that safety and health issues encompass a host of topics beyond mere regulatory compliance. In acknowledging this fact, one can see mine safety and health management emerging as a distinct discipline within the general ambit of mining engineering. The mining industry continues to seek better and more effective means by which to improve safety and health conditions in mining. This course will provide opportunities to enhance students’ understanding and appreciation of the mining safety imperative.

APPROVALS:

Date 9/26/12

Signature, Chair, Program/Department of:

Date 10/3/2012

Signature, Chair, College/School Curriculum Council for:

Date 6/3/12

Signature, Dean, College/School of:

Date

Signature of Provost (if applicable)

Offerings above the level of approved programs must be approved in advance by the Provost.
ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

Date

ADDITIONAL SIGNATURES: (If required)

Signature, Chair, Program/Department of:

Date

Signature, Chair, College/School Curriculum Council for:

Date

Signature, Dean, College/School of:
Course Information

Min 445: Accidents, Emergency and safety Managements in Mines

3+ 0 Credit hours, Pre-Req: Min 302, concurrently Min 454, or Permission of the Instructor.
Alternate Fall, M, W & F, 8:00 AM – 9:00 AM

2013 Catalog Description: Accident statistics, Accident investigation & prevention, Major provisions of current laws, Rule making procedures, Mine fires and explosions, causes and prevention, Loss control principles and methods, Emergency evacuation, Emergency response & Emergency preparedness, Safety management systems and behavioral science applications.

Course Instructors: Sukumar Bandopadhyay, PhD., P.E., Professor of Mining Engineering, 311 Duckering Building, College of Engineering & Mines, Ph: 904-474-6876, Email: sbandopadhyay@alaska.edu

Text book/Course Materials: Instructor’s notes will be made available to the students.
Suggested Reading Materials: various mining accident reports in the public domain, MSHA publications on mining safety and accidents, CFR 30, part 75, subpart-D

Course Objectives: In today’s mining industry, all levels of management understand the moral obligation, as well as economic justification, for running operations in a manner that safeguards the health and safety of their workers. These factors, coupled with the enforcement liabilities attached to the ever increasing maze of state and federal regulations, requires mining engineers to be experienced in health and safety issues. The mining industry continues to seek better and more effective means by which to improve safety and health conditions in mining. The objective of this course is to provide opportunities to enhance students’ understanding and appreciation of the mining safety imperative.

Student Learning Outcomes: Fundamental knowledge Goals
1.1: Understanding of moral obligation and economic justification of mine safety programs
1.2: Effective Means of improving health and safety in mines

Student Learning Outcomes: Competency & Ability Goals
2.1 Health and Safety Issues in Mining
2.2 Recognition of unsafe behavior
2.3: Accident analysis and investigation methods
2.4: Federal Regulations, Enforcements and rule making Procedures
Instructional Method: In class lectures, & case studies

Course Calendar:

Mine Accidents

- **August 30, & September 2, 2013**: Accidents Statistics in Coal and Metal Mines
- **September 4, and September 6, 2013**: Analysis of Incidents and Accidents, reportable accidents, & safety Auditing
- **September 9, and September 11, 2013**: Near Misses, and accident mitigations
- **September 13, and September 15, 2013**: Accident Investigations
- **September 16 & September 18, 2013**: Training, Education & Culture of Safety

Spontaneous Combustions of Coal and Metal Mine Fires

- **September 20 & September 23, 2013**: Mechanism of spontaneous combustion of coal
- **September 25 & September 27, 2013**: Spontaneous Fire Risk and Preventive Measures
- **September 30, 2013**: Detection and assessment of heating in a mine
- **October 2, 2013**: Combating of Coal Mine Fires

Explosion in Coal and Metal Mines

- **October 2 & October 4, 2013**: Explosion in Coal Mines, Causes & Prevention
- **October 7 & October 9, 2013**: Sulphide Dust Explosions in Underground Mines
- **October 11 and October 14, 2013**: Variables influencing sulphide dust explosion, physics and energy equations
- **October 16, & October 18, 2013**: Secondary Dust Explosion, Causes and Prevention & control
- **October 21, 23, & October 25, 2013**: Control of Sulphide dust explosions – case studies

- **October 28, 2013**: Safety Management of Underground Sulphide Dust
- **October 30, 2013**: Movies: You are my Sunshine, Upper Big Branch Explosion and Famington # 9

- **November 1, 2013**: Sago Mine Explosion - Analysis
- **November 4, 2013**: Mid-Term Examination
Mine Emergency and Emergency Preparedness

November 6, 2013: Mine Ventilation Risks
November 8, 2013: Mine Plans, Evacuation and Escape ways
November 11, 2013: Emergency Response Plan
November 13 and November 18, 2013: Emergency Exercises
November 20, and November 22, 2013: Self-contained Self Rescuers
November 25, 2013: Thanksgiving Holiday
November 27, 2013: Emergency communication & Miner Tracking
November 29, 2013: Refuse Alternatives
December 2, 2013: Emergency crisis Planning
December 4, 2013: Escape & Evacuations
December 6, 2013: Safety Management in Mine Ventilation
December 9, 2013: Implementation of Ventilation Management Plan
December 10—15: Final Examination

Computer Use: (1) Sponcom: A Computer Program for the Prediction of the Spontaneous Combustion Potential of an Underground Coal Mine
(2) MFIRE: A computer Program for Analyzing Mine Fire

Course Policies: (1): No-make examination (In case of illness, make-up exam may be granted if a Doctor’s note is submitted). No early exams will be given.

(2) Plagiarism/Academic Integrity: As stated in UAF policies & Regulations
(3) Attendance is required for a passing grade.
(4) All home works, and project works need to be submitted electronically (MS word file). No hand written submission of the homework or project work will be accepted.
(5) Late submission of any homework or project work will be checked but will not count towards the final grade for the class.

Course Evaluation: The students will be evaluated based on absolute scores. Two in-class examinations (Mid-term & final) will be 60% of the total grade, class-home works will consist of 15% of the grade, class project will consist of 20% of the grade, and class-participation & attendance will count for 5% of the grade.
A student who receives 90% or above will get an “A” grade, 85-90% will get a “B” grade, 80-85% will count for a B’, etc.

Disabilities Services: Will follow UAF rules & regulations.
Course Information

Min 645: Accidents, Emergency and Safety Managements in Mines

3+0 Credit hours, Pre-Req: Min 302, or equivalent, graduate standing or Permission of the Instructor.
Alternate Fall, M, W & F, 8:00 AM – 9:00 AM
Location: TBD

2013 Catalog Description: Accident statistics, Accident investigation & prevention, Major provisions of current laws, Rule making procedures, Mine fires and explosions, causes and prevention, Loss control principles and methods, Emergency evacuation, Emergency response & Emergency preparedness, Safety management systems and behavioral science applications.

Course Instructors: Sukumar Bandopadhyay, PhD., P.E., Professor of Mining Engineering, 311 Duckering Building, College of Engineering & Mines, Ph: 904-474-6876, Email: sbandopadhyay@alaska.edu
Office hours: TBA

Required textbook: Instructor’s Class Notes & PP Slides
Recommended reading: UBB Accident Report, Sunshine Mine Fire Report, CFR 30 Part 75, Sub part -D
Required supplies: if any: None

Course Objectives: In today’s mining industry, all levels of management understand the moral obligation, as well as economic justification, for running operations in a manner that safeguards the health and safety of their workers. These factors, coupled with the enforcement liabilities attached to the ever increasing maze of state and federal regulations, requires mining engineers to be experienced in health and safety issues. The mining industry continues to seek better and more effective means by which to improve safety and health conditions in mining. The objective of this course is to provide opportunities to enhance students’ understanding and appreciation of the mining safety imperative.

Student learning outcomes: After completing this course, students will be able to: (1) understand and appreciate the mining safety imperative; (2) identify major health and safety hazards in mining; (3), conduct accident analysis and accident prevention; (4) improve safety and health conditions in mines; and (5) use a systematic approach to mine safety and health management; (6) respond to mine emergency and develop mine emergency plans.

Instructional methods:
The course is primarily lecture based, although in-class assignments will be required bi-weekly.
## Course Calendar:

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- **August 30, & September 2, 2013**: Accidents Statistics in Coal and Metal Mines
- **September 4, and September 6, 2013**: Analysis of incidents and accidents, Reportable accidents, & Safety auditing
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- **September 13, and September 15, 2013**: Accident Investigations
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November 11, 2013: Emergency Response Plan

November 13 and November 18, 2013: Mine Emergency Exercises

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December 6, 2013: Safety Management in Mine Ventilation
December 9, 2013: Implementation of Ventilation Management Plan
December 10—15: Final Examination

Computer Use: (1) Sponcom: A Computer Program for the Prediction of the Spontaneous Combustion Potential of an Underground Coal Mine
(2) MFIRE: A computer Program for Analyzing Mine Fire

Required Term Papers: (1) A forensic Analysis of a selected mine explosion
(2) Spontaneous combustion potential of a selected Alaskan coal deposit (Computer Analysis)

Course Policies: (1): No make-up examination (In case of illness, make-up exam may be granted if a Doctor's note is submitted). No early exams will be given.

(2) Plagiarism/Academic Integrity: As stated in UAF policies & Regulations
(3) Attendance is required for a passing grade.
(4) All home works, and project works need to be submitted electronically (MS word file). No hand written submission of the homework or project work will be accepted.
Late submission of any homework or project work will be checked but will not count towards the final grade for the class.

DISABILITIES SERVICES
The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. The instructor will work with the Office of Disabilities Services (208 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities. Contact: Mary Matthews, Disability Services, fnmkm@uaf.edu, x5655.

Course Evaluation: The students will be evaluated based on absolute scores. Two in-class examinations (mid-term & final) will be 50% of the total grade, class projects (term-papers) will consist of the other 50% of the grade. A student who receives 90% or above will get an “A” grade, 85-90% will get a “B” grade, 80-85% will count for a B-, etc.

The projects (term-papers) will graded based on the research quality, research content, and completeness, and it is expected that quality of the term papers will be such that these can be published in a conference or peer-reviewed journals.

Disabilities Services: Will follow UAF rules & regulations.