LSC Use Only
Number:
Submission Date:
Action-Date:

UWUCC USE Only
Number: 96-56g
Submission Date:
Action-Date: App 4/15/97
Senate App 4/29/97

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. **CONTACT**

Contact Person Mr. Chekanski Phone 3018

Department Safety Sciences

II. **PROPOSAL TYPE (Check All Appropriate Lines)**

X **COURSE** Haz Prev Management
Suggested 20 character title

___ New Course* ___
Course Number and Full Title

X Course Revision SA 412 Evaluation of Safety Program Effectiveness
Course Number and Full Title

___ Liberal Studies Approval + for new or existing course ___
Course Number and Full Title

___ Course Deletion ___
Course Number and Full Title

X Number and/or Title Change SA 412 Evaluation of Safety Program Effectivenes
Old Number and/or Full Old Title

SA 412 Hazard Prevention Management
New Number and/or Full New Title

X Course or Catalog Description Change SA 412 Evaluation of Safety Program Effectiveness
Course Number and Full Title

___ **PROGRAM:** ___ Major ___ Minor ___ Track

___ New Program* ___
Program Name

___ Program Revision* ___
Program Name

___ Program Deletion* ___
Program Name

___ Title Change ___
Old Program Name

___
New Program Name

III. **Approvals** (signatures and date)

Lon H. Ferguson 3/12/96 (LF 11/11/96)	Robert Boule 11 Nov 96 12 FEB 96
Department Curriculum Committee	Department Chair
Mary E. Sumner 11/11/96	Carleen A. Zoni 11 Nov 96
College Curriculum Committee	College Dean
	2/4/97
+Director of Liberal Studies (where applicable)	*Provost (where applicable)

*No new resources required

Attachment G

SA 412 Hazard Prevention Management

Catalog Description

1. **SA 412 Hazard Prevention Management** (3c-3l-4sh)

Prerequisites: MA 217, MG 311, Jr. Standing

Teaches various safety management techniques to identify and prevent the occurrence of hazardous behavior and conditions. Devises methods capable of extracting accurate, meaningful data, methods of collecting, codifying and processing hazard and loss incident information, and utilizing data retrieval systems to be used in cost/benefit decision-making for hazard prevention, safety program and performance evaluation, and risk management.

SYLLABUS OF RECORD

I. Catalog Description

SA412 Hazard Prevention Management

4 credits
3 lecture hours
3 laboratory hours
(3c-3l-4sh)

Prerequisites: MA 217, MG 311, Jr. Standing
Teaches various safety management techniques to identify and prevent the occurrence of hazardous behavior and conditions. Devises methods capable of extracting accurate, meaningful data, methods of collecting, codifying and processing hazard and loss incident information, and utilizing data retrieval systems to be used in cost/benefit decision-making for hazard prevention, safety program and performance evaluation, and risk management.

II. Course Objectives

The students will be able to:

A. The student will be able to list program elements within the safety function and state one specific procedure contained in each element.

B. Given a management structure, the student will be able to describe the responsibility of each manager for hazard prevention.

C. Given scenarios about the origins of hazards, the student will be able to state who was responsible for preventing the hazards that occurred.

D. Given information about a company, the student will be able to develop a safety policy for that company. Using that same information the students will be able to determine whether a safety committee is needed. If one is needed, the students will be able to develop an appropriate committee charter.

E. Given data about a company, the students will be able to determine what programs are needed, develop goals for the programs and write procedures that will achieve the goals of needed programs.

F. Given data about loss incidents including hazardous behavior and conditions, the student will be able to use Fishbone diagrams, run charts, control charts, Pareto charts, scatter diagrams, and force field analysis to determine action to prevent recurrence of the hazardous behavior and conditions.

G. Given data about hazardous conditions at a company and the organization of that company, the student will be able to determine who was responsible for allowing the condition to be created in the workplace and will be able to state the action needed to prevent recurrence of the hazardous condition and who will take the action. Also, using these same data, the students will be able to measure the effectiveness of the company's hazard prevention procedures.

H. Given descriptions of hazardous behavior, the students will be able to determine the causes of each act as being: Lack of training, lack of motivation, and from creating an environment that does not fit the mental and physical capabilities of the employees. The students also will be able to analyze hazardous behaviors to determine obstacles to safe behavior and ways to remove those obstacles and determine new antecedents and consequences so that the hazardous behavior will not recur.

I. Given data about a work environment, the students will be able to develop a safe behavior reinforcement program for this environment.

J. The students will be able to analyze the hazardous behaviors that were caused by lack of training and write behavioral objectives, determine teaching methods, and write lesson plans to train employees to remove these causes of hazardous behavior.

K. The students will be able to describe methods to calculate and collect costs resulting from the occurrence of hazards. Given cost and cause data, the students will be able to conduct cost/benefit analyses for hazard prevention.

L. Given various measurement data about a company, the students will be able to measure the effectiveness of the company's safety programs.

M. Given the safety efforts and hazard results of a company and an organizational structure for the company, the students will be able to measure the accountability of each of the managers regarding their safety performance.

N. Given risk data, the students will be able to conduct a risk assessment.

O. The students will be able to explain the different kinds of insurance. Given claim data, the students will be able to calculate workers compensation insurance ratings. Further, the students will be able to explain the process for litigating claims.

P. Given data about hazards, the students will be able to develop a risk management program that will prevent hazards at a reasonable cost.

III. Course Outline

A. Scope of the Safety Function (1 hour)

Covered is the scope of the safety function: Injury Prevention, Occupational Illness Prevention, Property Loss Prevention, and Environmental Protection. Each major scope area is subdivided as follows: Injury prevention; employees while on the job, employees and family members while off the job, visitor safety, contractor safety, consumer protection and trespasser prevention. Occupational Illness Prevention; toxic materials control, hearing conservation, ionizing radiation protection, non-ionizing radiation protection, heat stress control and ergonomics. Property Loss Prevention; product, equipment/facilities, fleet, fire protection, disaster preparedness, and vandalism and sabotage prevention. Environmental Pollution Prevention; air, water, hazardous waste disposal, radioactive waste disposal, noise pollution prevention, solid waste disposal.

B. Principles of Hazard Prevention (2 hours)

Line and staff management responsibility, authority, and accountability for preventing hazards are covered. The interaction between line and all staff positions is covered as it pertains to preventing hazards. The safety manager's role, responsibilities, authority, and methods of being held accountable within the management organization is explained.

C. Responsibilities for Hazard Prevention (2 hours)

The responsibilities for each staff and line department in hazard prevention programming are discussed with the idea of knowing to whom hazard prevention duties should be assigned. This involves discussing the responsibilities that process engineering, facilities engineering, maintenance, purchasing, accounting, upper line management, human resources, scheduling, and the legal departments have to create a hazard-free work environment.

D. Safety Policy Development (2 hours)

The students are introduced to the value of and criteria for developing a written safety policy statement. Covered are the advantages of having a written safety policy. Constructing a philosophy is taught. Developing objectives which are measurable, achievable, legal and ethical, consistent with other policies, understandable, and profit-oriented is taught. Defining the line and staff responsibilities, authority, and accountability as well as decision-making criteria are presented. Advantages and disadvantages of committees are discussed. Writing a committee charter is taught.

E. Hazard Prevention Programming (2 hours)

Following from the development of the safety policy statement, the student will be presented with the program analysis technique to determine what programs

are needed, including those within OSHA's Program Management Guidelines. Once the program needs are determined, developing program goals is taught; the goals being the removal of the causes of hazardous behavior and conditions. Selecting the procedures that are necessary to meet the program goals is presented. Developing procedures via flowcharting is presented. Using the responsibility assignments described in Unit Three, the student will be shown how to develop in chronological order the actions that must be taken to achieve program goals.

F. Total Quality Management in Hazard Prevention (3 hours)

Fishbone diagrams, run charts, control charts, Pareto charts, scatter diagrams, and force field analysis are introduced as a way to determine hazards and hazard prevention activities.

G. Hazardous Condition Prevention (2 hours)

A systems safety management loss incident sequence model is covered to show the causes of hazardous conditions. Methods to determine the causes for the occurrence of hazardous conditions are explored. Determining the responsibilities for each staff and line department to prevent hazardous conditions is completed. The idea that hazardous conditions result from hazardous behavior is explored. Using inspections to find and rate hazardous conditions as a way to measure the effectiveness of programs designed to prevent hazardous conditions. From this measurement management performance in preventing hazards is appraised.

H. Cause Analysis of Hazardous Behavior (3 hours)

A hazardous act analysis model is used to determine the cause of the hazardous act. The three causes of hazardous behavior are discussed: Lack of training, lack of motivation, and creating an environment that does not fit the mental and physical capabilities of the employees. Hazardous behavior is analyzed by listing the antecedents that prompted the employee to perform the hazardous behavior and by listing the positive consequences to the employee by performing the hazardous behavior. The corresponding safe behavior is analyzed by stating the safe behavior alternative to the hazardous behavior in observable terms such that 2 or more independent observers would agree that the described safe behavior was or was not committed. New antecedents that would prompt the employee to perform the safe behavior rather than the hazardous behavior are developed. Finding new consequences to the safe behavior that will motivate the employees to perform the safe behavior are listed. Action plans to provide each of the new antecedents and to apply each of the consequences are drafted.

I. Safe Behavior Reinforcement (3 hours)

Performance discrepancies, defining safe behavior, creating generic and job specific critical behavior inventories including the measuring of safe behavior,

baselines, intervention strategies including types of reinforcers, length of interventions, and reversal periods are presented. Safety sampling to measure percent safe behavior for determining the baseline and safety program effectiveness is taught.

J. Training to Prevent Hazardous Behavior (5 hours)

Training methods to prevent hazardous behavior caused by lack of training are presented. These cover conducting performance analyses, writing behavioral objectives, exploring appropriate teaching methods to meet the objectives, and writing lesson plans.

K. Loss Incident Costs (3 hours)

Costs involving medical and workers compensation payments, facility and equipment rental and replacement, labor to repair, replace or clean up of pollution, product damage, government fines, legal fees and settlements are taught. Costs involving the occurrence of hazards is presented also. Costing rates are used to calculate production downtime, overtime, and productive work lost costs. Cause and cost data collection procedures for injuries, illnesses, facility and equipment damage, product damage, environmental pollution, near loss incidents, and hazardous conditions are presented. The costs and causes are used in teaching cost/benefit analysis.

L. Safety Program Evaluation (3 hours)

Calculation of OSHA and MSHA injury rates is taught along with the safe-t-score technique to determine statistically significant changes in the rates. Criteria from accident experience, causal data, and accident prevention efforts are used to measure program effectiveness.

M. Management Performance Evaluation (2 hours)

Data from loss incident experience, hazardous behavior and conditions, and loss incident prevention efforts are used to measure individual managers for accountability purposes. Such data as incident frequency and severity, timeliness and completeness of loss incident investigations, follow through of corrective action and departmental hazard prevention procedure development and use are used in measuring accountability.

N. The Risk Management Process (3 hours)

The following subjects are covered: Defining risk management, contributing factors for risk, types of risk, probabilities for risk, risk assessment, laws of acceptable risk, residual risk, and perceived risk. The risk assessment steps of hazard identification, dose response assessment, exposure assessment and risk characterization are covered. Steps in the risk management process and identifying and analyzing loss exposure are also covered.

O. Role of Insurance (3 hours)

Presented are the definition and history of insurance, discussion of the insurance mechanism, the various types of insurance, the classification of insurers, insurance brokers, functions of insurance companies, rating bureaus, workers compensation insurance, insurance rating, and litigating workers compensation claims.

P. Establishing a Risk Management Program (3 hours)

Goals for the risk management program and organizing and controlling a risk management program are covered. Methods for planning, organizing, leading and controlling activities to minimize adverse effects of accidental losses at a reasonable cost are taught. The practice of weighting different hazard control strategies and selecting the most appropriate degree of control are presented.

Title of Laboratory Exercises	**# of Hours**	**Lecture Units Covered**
Defining a System for Analysis	3	A, B. C
Developing a Policy	3	D
Assessing Hazard Prevention Program Needs	3	E
Developing Programs	3	E
Assessing Programs via TQM Analysis	3	F
Analyzing Hazardous Conditions	3	G
Analyzing Hazardous Behavior	3	H
Reinforcing Safe Behavior	3	I
Devising Training Programs	3	J
Creating Training Devices and Sessions	3	J
Analyzing Decisions via Cost/Benefit	3	K
Evaluating Safety Programs	3	L
Measuring Management Accountability	3	M
Evaluating Risk Control Strategies	3	NOP

IV. Evaluation Methods

The faculty person assigned to teach this course could be one of several faculty within the Safety Sciences Department. What follows is an example of the evaluation methods and weighting used by one of those faculty members:

30% Exams: There will be written exams consisting of combinations of multiple choice, true/false, matching, completion, and essay questions; or other interactive exams. Make-up exams are at the discretion of the individual faculty member.

10% Quizzes: Periodic quizzes will be given. Unannounced quizzes may be used. Make-up quizzes are at the discretion of the individual faculty member.

5% Homework: Periodic out-of-classroom assignments will be given.

10% Term Papers/Projects: Each student will prepare formal papers or projects on a topic approved by the individual faculty member.

5% In-class Writing: Each student will prepare various assignments in class utilizing free-style writing techniques as scheduled by the individual faculty member.

10% Presentations: Each student will present orally a topic approved by the individual faculty member.

5% Class Participation: Each student will actively participate in classroom activities.

25% Laboratory Exercises: Laboratory exercises are a regular requirement of this course. Students will complete fourteen (14) laboratory exercises, each of which is described. discussed, interpreted, and reported in a formal technical report.

Extra credit may be assigned to any one or more of the above evaluation methods at the discretion of the instructor.

The grading scale is as follows:

A	90%-100%
B	80%-89%
C	70%-79%
D	60%-69%
F	< 60%

At the discretion of the faculty member, a grading curve that results appropriate distribution of grades may be used in place of the scale described above.

V. Required textbooks, supplemental books and readings

Required and supplemental readings will come from the following list:

Pope, William C. Managing for Performance Perfection: The Changing Emphasis. Weaverville, NC: Bonnie Brae, 1990.

Chekanski, Philip. Hazard Prevention (Transparency copies and course handouts for SA 412) Indiana, PA: ProPacket, University Square Mall, 1996.

Lack, Richard W. (ed). Essentials of Safety and Health Management. Boca Raton, FL: CRC Press, 1996.

V. Special Resource Requirements

None

VI. Bibliography

Brassand, Michael. The Memory Jogger Plus +: Featuring the Seven Management and Planning Tools. Methuen, MA: GOAL/QPC, 1989.

Coyle, Ian R, et al. "Safety Climate." Journal of Safety Research. Vol. 26, No. 4, 1995.

Krause, Thomas R, et al. The Behavior-based Safety Process: Managing Involvement for an Injury-free Culture. New York: Van Nostrand Reinhold, 1990.

Krause, Thomas and John Hidley. Behavioral Science Methods for Accident Prevention. Ojai, CA: Behavioral Science Technology, Inc., 1986.

Mager, Robert F., and Peter Pipe. Analyzing Performance Problems: Or You Really Oughta Wanna. 3rd ed. Belmont, CA: Lake Publishing, 1993.

Geller, E. Scott et al. Behavior Analysis Training for Occupational Safety. Newport, VA: Make-A-Difference, Inc., 1989.

Geller, E. Scott et al. Behavior Analysis Training for Occupational Safety: Practice Workbook. Newport, VA: Make-A-Difference, Inc., 1989.

Geller, E. Scott et al. Behavior Analysis Training for Occupational Safety: Discussion Workbook. Newport, VA: Make-A-Difference, Inc., 1989.

Manuele, Fred A. "Guidelines: Designing for Safety," A Technical Paper from Marsh & McLennan M&M Protection Consultants, 1995.

Petersen, Dan. Safe Behavior Reinforcement. Goshen, NY: Aloray, 1989.

Pierce, F. David. Total Quality for Safety and Health Professionals. Rockville, MD: Government Institute, Inc., 1995.

Samson, Thomas M. and Brian O. Hurt. "Managing Health and Safety Data." Occupational Health and Safety. December, 1995.

Smith, Thomas A. "The Safety Improvement Process: Targeting for Continuous Improvement of Safety Performance." Manuscript submitted for publication, 1995.

VII. Historical Bibliographies

Chekanski R. Philip. "A Loss Control Information System: Techniques for Its Implementation." Occupational Hazards- Focus Section: Journal of the National Safety Management Society. April, 1974.

Nolden, Carol. "The Work Order System: Key to Effective Maintenance Management." Plant Engineering. October 13, 1983.

Police, Jacquelyn Marie. "The 'Systems' Approach in Accident Reporting." Occupational Hazards- Focus Section: Journal of the National Safety Management Society. June, 1979.

Wright, R. Loss Management: International Management Audit System and LOMIS Incident Report Code Manual. Toronto. Gulf Oil of Canada, Ltd., Not dated.

Course Revision: SA 412 Hazard Prevention Management

Part II. Description of the Curriculum Change

1. The new syllabus of record for this revised course is attached.

2. What follows is a summary of the proposed changes to SA 412:

   a. The course description was changed to include the new content for the revised course.

   b. The number of objectives was increased from three to sixteen with the new objectives reflecting the needs of the ABET accreditation requirements.

   c. In general, the new material was added to focus on hazard prevention. Other safety sciences courses deal with identifying, evaluating, and controlling workplace hazards. The additional emphasis in the proposed course is to prevent hazards from occurring in the first place reducing the need to identify, evaluate, and control hazards.

   d. The first four units (A-D) and Units L and M are essentially the same as in the current course. Units F through I are changed and expanded as follows: In the current course hazardous behavior and hazardous conditions are used to measure the effectiveness of safety programs. In the proposed course the emphasis is expanded to prevent hazardous behavior and conditions. This addition enables the students to expand their loss control skills beyond the identification, evaluation, and control of hazards. Also our accrediting agency (ABET) requires that the psychology of accidents and their prevention be taught.

   e. Unit E Hazard Prevention Programming is added because ABET calls for this topic to be taught and it is important that the students be able to translate all their technical knowledge gained form all course work into a usable form (programs and procedures) that their employers can use to prevent loss incidents.

   f. The information presented in Units C through J of the current course has been reduced in depth and is covered in Units K, L, M and throughout Units F through I of the proposed course.

   g. Units N, O and P Risk Management have been added to meet ABET's requirements. Further, many of our graduates are employed by insurance companies. Both prospective employers and many of our graduates have indicated that this is an important topic for them.

   h. To adequately teach the principles presented in the current course and the principles introduced in the proposed course and to allow the students to gather, manipulate and draw conclusions from pertinent data, a laboratory experience has been added to the scope of the course.

   i. The title of the course was changed to reflect the added content: "Evaluation of Safety Programs" to "Hazard Prevention Management."

   j. MG 311 Human Behavior in organizations was added as a prerequisite.

   k. A three hour laboratory was added to this class.

3. In general these revisions were necessary to meet ABET accreditation requirements and to update the principles taught to our students. The traditional safety approach is to treat an accident as an undesirable event. The students are taught to identify, evaluate, and control the hazardous behavior and conditions that caused the accident. This new course goes one step further by teaching the students to treat hazardous behavior and conditions as undesirable events. The students are being taught to identify, evaluated and control the causes of the hazardous behavior and conditions. Removing the reasons why hazardous behavior and conditions occur is the definition for hazard prevention and adds a new dimension to safety management.

4. The old syllabus of record is attached.

5. These course changes do not affect the Liberal Studies requirements.

Part III. Letters of support

These course changes will not affect other departments; therefore, letters of support from other departments were not obtained.

SYLLABUS OF RECORD

I. Catalog Description

SA 412 Evaluation of Safety Program Effectiveness
Prerequisites: MA 217, junior standing 3c-01-3sh

Teaches reasons and importance of evaluating the effect of safety and health innovations on organization performance, devising measuring systems capable of extracting accurate, meaningful data, methods of collecting, codifying, and processing accident-injury information, and utilization of data retrieval systems.

II. Course Objectives

The students will be able to evaluate the effectiveness of safety and health programs based on a knowledge of the elements of successful programs and the following broad measurement criteria for those elements: 1) incident experience, 2) casual experience, and 3) incident prevention efforts.

III. Course Outline

A. Total Loss Control (2 hours)

B. Development of Program Goals and Effectiveness Criteria (3 hours)

C. Industrial Evaluation Standards (6 hours)

D. Cost as an Evaluation Criterion (3 hours)

E. Facility and Equipment Damage Data Collection Procedure (2 hours)

F. Product Damage Collection Procedures (2 hours)

G. Injury/Illness Data Collection Procedure (2 hours)

H. Environmental Pollution Data Collection Procedure (1 hour)

I. Near Loss Incident Data Collection Procedure (1.5 hours)

J. Loss Incident Reporting and Data Collection (1 hour)

K. Review of Statistical Principles (2 hours)

L. Control Charting Techniques (6 hours)

M. Supervisory Accountability Evaluation (7.5 hours)

N. Management Accountability Evaluation (3 hours)

IV. Evaluation Methods

The final grade will be determined by using any combination of at least four(4) of the following evaluation methods within the range of weights shown as determined by the individual faculty member and which must total 100%.

0-60% Exams	There will be a minimum of two written exams consisting of combinations of multiple choice, true/false, matching, completion, and essay questions; or other interactive exams. Make-up exams are at the discretion of the individual faculty member.
0-25% Quizzes	Periodic quizzes will be given. Some individual faculty members may utilize unannounced quizzes. Make-up quizzes are at the discretion of the individual faculty member.
0-15% Homework	Periodic out-of-classroom assignments will be given.
0-40% Term Papers/ Projects	Each student will prepare formal papers or projects on a topic approved by the individual faculty member.
0-20% In-Class Writing	Each student will prepare various assignments in class utilizing free-style writing techniques as scheduled by the individual faculty member.
0-25% Presentations	Each student will participate in an oral presentation topic approved by the individual faculty member.
0-20% Participation	Each student will provide active engagement in the classroom.
0-25% Group Activity	Students will be assigned various activities requiring a collaborative effort with other students.

Extra credit can be assigned to any one of the above evaluation methods at the discretion of the instructor.

The grading scale will be based on the following:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	< 60%

or, at the discretion of the faculty member a grading curve that results in a normal distribution of grades.

V. Required Textbooks, Supplemental Books and Readings

Petersen, Dan. Techniques of Safety Management: A Systems Approach. Aloray Inc., Goshen, NY. Third edition.

Pope, William C. Managing for Performance Perfection: The Changing Emphasis. Bonnie Brae, Weaverville, NC, 1990.

Chekanski, Philip. "Safety Program Evaluation" (Transparency copies and course handouts for SA 412).

Wright, R. "Loss Management: International Management Audit System and LOMIS Incident Report Code Manual," Gulf Oil of Canada, Ltd. Not dated.

Police, Jacquelyn Marie. Occupational Hazards - Focus: Journal of the National Safety Management Society. "The 'Systems' Approach in Accident Reporting." June, 1979.

Chekanski, Philip R. Occupational Hazards - Focus Section: Journal of the National Safety Management Society. "A Loss Control Information System: Techniques for Its Implementation," April, 1974.

Nolden, Carol. Plant Engineering: "The Work Order System: Key to Effective Maintenance Management," October 13, 1993.

Tarrants, William E. The Measurement of Safety Performance. Garland STPM Press, New York, 1980.

Petersen, Dan. Safety By Objectives SBO. Aloray, Inc., Goshen, NY. 1978.

Christensen, Richard L. "Evaluation of Safety Program Effectiveness" (Course Handout Material for SA 412).

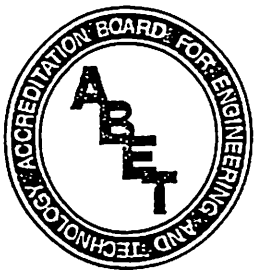
Christensen, Richard L. "Evaluation of Safety Program Effectiveness" (Course Homework Problems for SA 412).

Attachment H

ABET Accreditation Criteria

CRITERIA FOR ACCREDITING ENGINEERING-RELATED PROGRAMS

Effective for Evaluations During the
1997-98 Accreditation Cycle
(Incorporates all changes approved by the ABET Board of Directors as of November 2, 1996)



Related Accreditation Commission
Accreditation Board for
Engineering and Technology, Inc.
111 Market Place, Suite 1050
Baltimore, MD 21202
Telephone: (410) 347-7700
Fax: (410) 625-2238
Website: http://www.abet.ba.md.us

4. Administration.

a. Program Coherence.

The program shall be a coherent, clearly identified entity within the institution.

b. Advising.

Students will be advised by faculty who are members of the industrial management program.

c. Leadership.

The faculty identified for this program must include a designated person who is responsible for managing and coordinating the program.

PROGRAM CRITERIA FOR SAFETY AND SIMILARLY NAMED ENGINEERING-RELATED PROGRAMS

Submitted by the American Society of Safety Engineers

1. Applicability-Baccalaureate.

These program criteria apply to safety, occupational safety, industrial safety and similarly named engineering-related programs at the baccalaureate level.

a. Curriculum.

1. Basic Science and Mathematics. (Amplifies criteria section IV.C.3.)

(a) The minimum requirements for mathematics must include: (i) calculus; and (ii) statistics.

(b) The minimum requirements for basic sciences must include: (i) two courses with laboratories for physics; (ii) two courses with laboratories for chemistry, including organic; and (iii) one course with laboratory for human physiology, human anatomy, or general biology.

2. Communications, Humanities, and Social Sciences. (Amplifies criteria section IV.C.4.)

The minimum requirements for communications must include: (a) one course in written composition, and (b) one course in speech.

The minimum requirements for social sciences must include an introduction to psychology.

A business or management course is recommended.

3. Engineering-Related Sciences-Definition. (Amplifies criteria section IV.C.1.)

Some engineering-related sciences shall be termed safety sciences and shall expand topics of basic science toward application in professional practice. A topic shall be identified as a safety science if it amplifies basic science or mathematics, is taught by safety faculty, solves closed-form problems, and contains quantitative expression.

4. Engineering-Related Sciences-Program Requirements. (Amplifies criteria section IV.C.1.)

The minimum requirements for safety science must include:

(a) courses in the following: (i) analysis and design for safety; (ii) industrial hygiene and toxicology with laboratory; (iii) system safety and other analytical methods for safety, and

(b) An educational experience in measurement of safety performance.

5. Engineering-Related Specialties-Definition. (Amplifies criteria section IV.C.2.)

Some engineering-related specialties shall be termed safety professional practice where safety sciences and related specialties are applied to solve needs of society and identified clients. A topic is properly placed in this category if it applies safety sciences or related specialties to these needs, employs open-form problems usually resulting in a written solution, involves cost and ethical consideration, and requires independent judgment to integrate specialty areas into a professional service.

6. Engineering-Related Specialties-Program Requirements. (Amplifies criteria section IV.C.2.)

The minimum requirement for safety professional practice must include:

(a) courses with comprehensive coverage of the following subjects:

(i) introduction to safety and health
(ii) safety and health program management
(iii) fire prevention, protection, and control
(iv) ergonomics
(v) legal aspects of safety
(vi) Environmental safety and health, and

(b) an educational experience in the following subjects:

(i) accident/incident investigation and analysis
(ii) psychology of accidents and their prevention
(iii) product safety
(iv) construction safety
(v) educational and training methods for safety.
(vi) an introduction to industrial or manufacturing processes
(vii) applied mechanics for safety

7. Experiential Education

There shall be either an internship or co-op course supervised by safety faculty which places the student at industrial, institutional, or governmental work sites where hazard control programs are planned and implemented. Students should be assigned significant hazard assessment activities involving safety, health, fire, and other hazards.

8. Program Level and Course Requirements. (Amplifies criteria section IV.A.1.b.)

There must be a minimum of 54 semester hours in safety sciences and safety professional practice.

9 Unspecified Hours. (Amplifies criteria section IV.A.1.e.)

The unspecified portion of a curriculum gives freedom to meet stated objectives without constraint by the accrediting process. Professional practice in safety varies from state to state, depending on local law and custom. The nature of the profession varies by employer and type of business. Unique program objectives may be met by courses placed here, leading to the possibility of program specialization within the broad safety profession.

b. Faculty.

1. Size of Faculty. (Amplifies criteria section IV.F.2.) To achieve sufficient breadth and depth, a minimum faculty of three full-time

members is required. One of these three full-time faculty positions can be met with full-time equivalency.

2. Faculty Qualifications. (Amplifies criteria section IV.F.3.) Safety faculty will not only lecture to students but will also generate new knowledge and demonstrate new ways to apply basic principles to real situations. The majority of the faculty members must have advanced degrees appropriate to their area of expertise, extensive professional experience, and certification by the Board of Certified Safety Professionals, or, if appropriate to their area, by other recognized certification bodies. Active participation in state and national professional societies is expected of all faculty members. The majority of faculty members are expected to be active in research, scholarly activities, and/or consulting.

3. Leadership. A full-time employee must be identified as being administratively in charge of the program. (see criteria section IV.F.4.)

2. Applicability-Masters.

The following program criteria apply to safety, occupational safety, industrial safety, and similarly named engineering-related programs at the master's level.

a. Candidate Requirements. (Amplifies criteria section IV.A.2.a.)

Candidates for master's-level degree programs must hold a baccalaureate degree based on a minimum of 120 semester hours or the equivalent that must include 63 or more semester-hour credits in undergraduate or graduate-level courses in science, mathematics, engineering, and technology, with at least 15 of these at the upper (junior, senior or graduate) level and a minimum of 21 semester-hour credits, or the equivalent, in communications, humanities, and social sciences. (See also criteria section IV.c.5.)

b. Curriculum.

1. To be considered for accreditation, a safety program must be designed to prepare students for the practice of or advancement in the safety profession. Such a program must have: (a) an adequate foundation in mathematics and basic sciences, humanities and social sciences, safety sciences, and safety professional practice, and (b) a specialization in advanced safety topics appropriate to the challenges presented by today's occupational, system, process, product, transporation, or environmental safety problems.

2. A minimum of 30 semester hours will be required for a master's degree in safety. The safety program must demonstrate an intensive and comprehensive level of interdisciplinary instruction. Its content may include special projects, research, and a thesis or internship. Special emphasis also may be placed on the development of research capability, management skills, and interdisciplinary and governmental relationship. (Amplifies criteria section IV.A.2.b.)

3. Engineering-Related Sciences-Program Requirements. (Amplifies criteria section IV.C.1. See program criteria for safety and similarly named engineering-related programs section 1.a.(3) for definition of engineering-related sciences.)

To prepare students for practice in the safety profession, the academic program must introduce the student to the tools, methods, terminology, and professional services of the requisite interdisciplinary areas. Toward that goal, a master's-level program in safety must offer the following areas:

(a) principles and practice of the safety profession
(b) principles and practice of health and environmental sciences
(c) analytical methods in safety
(d) measurement of safety performance
(e) analysis and design for safety

4. Engineering-Related Specialties-Program Requirements. (Amplifies criteria section IV.C.2. See program criteria for safety and similarly named engineering-related program, section a.1.(5), for definition of engineering-related specialties.)

A master's-level program in safety must offer safety professional practice courses. Typical topics are:

(a) fire prevention, protection, and control
(b) legal aspects of safety
(c) accident investigation and analysis
(d) management of safety programs
(e) environmental aspects of safety
(f) education and training for safety
(g) human performance and safety
(h) control of hazards.

5. Program Level and Course Requirements. (Amplifies criteria section IV.A.1.b.) A minimum of 20 semester hours must be in safety sciences and safety professional practice. Course content must be significantly more specialized, complex, or advanced than similar courses offered at a lower level.

6. Unspecified Hours. (Amplifies criteria section IV.A.1.e.) The unspecified portion of the curriculum gives freedom to meet stated objectives without constraint by the accrediting process. Professional practice in safety varies from state to state, depending on local law and custom. The nature of the profession varies by employer and type of business. Unique program objectives may be met by courses placed here, leading to the possibility of program specialization within the broad safety profession. Typical topics are: (a) legal and regulatory processes, public policy, and protection of the public; (b) safety practices related to particular industries (construction, petroleum, mining, manufacturing, transportation, health care, government, etc.); and (c) application of advanced methods and new technologies to safety.

c. Faculty. The program must meet the same faculty requirements as specified in program criteria for safety and similarly named engineering-related programs, section 1.b.

PROGRAM CRITERIA FOR SURVEYING AND MAPPING AND SIMILARLY NAMED ENGINEERING-RELATED PROGRAMS

Submitted by the American Congress on Surveying and Mapping (Lead society, with the American Society of Civil Engineers)

1. Applicability.

These program criteria apply to programs named "surveying and mapping" and similar titles.

2. Curriculum.

a. Basic Science and Mathematics. (Amplifies criteria section IV.C.3.)

A minimum of 15 semester-credit hours (approximately 1/2 academic year) will be required in mathematics and a minimum of 15 semester hours (approximately 1/2 academic year) will be required in basic sciences. The course work in mathematics shall be in courses beyond trigonometry and shall not include courses in computer programming