

MASTER OF SCIENCE
in
INDUSTRIAL HYGIENE

PROGRAM GUIDE

GIH 12M
GIH 13M
GIH 14M

1. Purpose:

The GIH Program was designed to provide Air Force career professionals with relevant graduate education in the principles of industrial hygiene. This program was developed considering guidelines established by the Accreditation Board for Engineering and Technology and subject areas from the professional certification exam for the American Board of Industrial Hygiene. The GIH program complements the Environmental Engineering and Science degree and both programs share many core classes. Both programs were motivated by a request from the AF Bioenvironmental Engineering career field. The core curriculum includes course offerings in statistics, chemistry, risk assessment, industrial hygiene, industrial ventilation, radiation protection, chemical fate and transport in the environment, epidemiology, physiology, and toxicology.

a. Program Educational Objective:

Ethical, technically-competent Environment, Safety, and Occupational Health professionals able to anticipate, recognize, evaluate, and recommend feasible control strategies for chemical, biological, and physical health hazards at Air Force, sister service, civilian, and foreign industrial and community environments.

b. Program Mission Statement:

Provide Air Force officers and civilian career professionals with relevant graduate education in the disciplines of industrial hygiene consistent with future duties across the spectrum of Air Force and environment, safety, and occupational health (ESOH) consulting and management duties.

c. Program Outcomes: Graduating students should be able to:

- i. **Anticipate/Recognize:** Identify agents, factors, and stressors generated by and/or associated with defined sources, unit operations, and/or processes; Describe qualitative and quantitative aspects of generation of agents, factors, and stressors; Understand physiological and/or toxicological interactions of physical,

- chemical, biological, and ergonomic agents, factors, and/or stressors with the human body
- ii. **Evaluate:** Assess qualitative and quantitative aspects of exposure assessment, dose-response, and risk characterization based on applicable pathways and modes of entry; Calculate, interpret, and apply statistical and epidemiological data; Interpret and apply applicable occupational and environmental regulations
 - iii. **Control:** Recommend and evaluate engineering, administrative, and personal protective equipment controls and/or other interventions to reduce or eliminate hazards
 - iv. **Manage:** Demonstrate an understanding of applicable business and managerial practices;

2. Admission Standards and Procedures

The general requirements for admission to the Master of Science program in Industrial Hygiene are:

- a. **A Bachelor's degree from an ABET accredited engineering program or a B.S. degree in a science related to environmental science, such as physics, biology, chemistry or industrial hygiene.**
- b. **Math courses including calculus through Ordinary Differential Equations.**
- c. **Courses in organic chemistry and biology.**
- d. **A cumulative undergraduate GPA of 3.0 (on a 4.0 scale), 1100 GRE combined verbal and quantitative score.**

NOTE: Deficiencies in the above areas may be waived or corrected through additional coursework on a case-by-case basis by the Department of Systems and Engineering Management.

3. Curriculum Description

The GIH program is conducted in six academic quarters and a short term (18 total months, beginning in September) for full time students. The short term program is the same program as required for the GEM/GES students and provides an orientation to the school and curriculum, a review of basic mathematics and chemistry, an introduction to the computer systems serving AFIT, and an overview of the environmental engineering and science program.

The 48-quarter hour (QH) degree requirements for the Industrial Hygiene degree will include specified core classes plus a 12 QH thesis with oral defense. The thesis can be basic or applied research, addressing a real-world problem in environment, safety, and occupational health (ESOH). Principal purposes of the thesis are to demonstrate the student's ability to integrate concepts and techniques acquired through course work and to demonstrate scholarly pursuit of a focused research question, all of which leads to enhanced capability of the graduate to pursue technical problems creatively and effectively across a broad spectrum of areas. Electives are offered in addition to strict degree requirements and broaden the student's horizons and/or provide more in-depth

knowledge in a specific area of interest, such as Environmental Toxicology and Chemical, Biological, Radiological, and Nuclear Threat Protection. A focus sequence is available in Biological Weapons Effects.

GIH 12M/13M/14M (Suggested 6 quarter program for full-time quota student)

<u>SHORT FALL</u>		<u>Credit Hours</u>
MATH	Math review	0
CHEM	Chemistry Review	0
ENVR	Intro to Engr & Envr Mgt	0
COMM	Written Communication	0
<u>FALL</u>		
STAT 525 ¹	Applied Statistics for Managers I	4
ENVR 550	Environmental Systems Engineering	4
ENVR 501	Environmental Mgt Colloquium	0
ENVR 541 ¹	Industrial Hygiene I	3
ENVR 651 ¹	Environmental Risk Analysis	3
ENVR 615	Industrial Hygiene Site Surveys	<u>1</u>
		15
<u>WINTER</u>		
ENVR 643 ¹	Environmental Transport Processes	4
ENVR 502	Research Perspectives Colloquium	0
STAT 535 ¹	Applied Statistics for Managers II	4
ENVR 528 ¹	Physiology & Toxicology	4
ENVR 615	Industrial Hygiene Site Surveys	<u>1</u>
		13
<u>SPRING</u>		
ENVR 503	Critical Review of Literature Colloquium	0
ENVR 547 ¹	Ionizing/Non-ionizing Radiation	3
ENVR 661	Environmental Sampling & Analysis	4
ENVR 543 ¹	Industrial Hygiene II and Lab	<u>4</u>
		11
<u>SUMMER</u>		
ENVR 544 ¹	Epidemiology	3
ENVR 548 ¹	Industrial Hygiene III and Lab	4
ENVR 504	Engineering Management Colloquium	0
ENVR 799 ¹	Thesis	<u>3</u>
		10
<u>FALL</u>		
ENVR 799 ¹	Thesis	3
ENVR 616	Elective – Advanced Industrial Hygiene	2
XXXXxxx	Elective	3
ENVR 505	Engineering Management Colloquium	0
ENVR 575	Applied Environmental Health	<u>3</u>
		11

WINTER

ENVR 799¹

ENVR 628

XXXX xxx

Thesis

Nuclear/Chemical Agent Effects

Elective

6

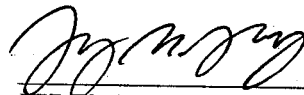
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3

12

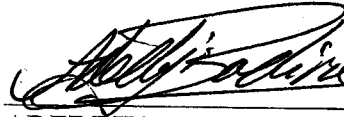
Total 72

¹ Required for 48-qb degree, 72 credits required for full time quota student



28 April 2010 AA

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GIH Curriculum Chair



28 April 2010

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