

# Industrial Hygiene

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## Degree Offered:

- Masters of Science, Industrial Hygiene (M.S.)

The Master's of Science with a major in Industrial Hygiene is accredited by the Applied Science Accreditation Commission of ABET, <http://www.abet.org>.

## PROGRAM EDUCATIONAL OBJECTIVES

Drawing from the university's mission, the program mission, the needs of our constituents, and the Applied Science Accreditation Commission Criteria of ABET, the following educational objectives were developed for the Masters of Science program in Industrial Hygiene:

1. Practice Industrial Hygiene and to initiate and develop leadership roles in business, industry, and/or government.
2. Continue professional development and life-long learning.
3. Interact in society and business in a professional, ethical manner to promote occupational and environmental health.
4. Be proficient in written and oral communication and to utilize people-oriented skills in individual and team environments.
5. Apply the skills from Industrial Hygiene to be proficient in his or her chosen field or doctoral studies.

## STUDENT OUTCOMES

In order to meet the Program Educational Objectives of the Industrial Hygiene program, students must be able to meet the following educational outcomes at the time of their graduation:

1. An ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice such as:
  - Principles and methods of industrial hygiene
  - Principles and methods of ergonomics
  - Principles and methods of safety
  - Principles of environmental sciences
  - Principles of epidemiology and biostatistics
  - Principles and methods of control of physical and chemical hazards
2. The ability to apply knowledge of math, science, and Industrial Hygiene;
3. The ability to design and conduct experiments, analyze and interpret data, develop implementation strategies, and shape recommendations so that results will be achieved and findings will be communicated effectively;
4. The ability to work individually, in teams, and/or in multi-disciplinary teams to identify, formulate, and solve problems using Industrial Hygiene, safety, and ergonomics knowledge, skills, and tools;
5. An ability to formulate or design a system, process, or program to meet desired needs;
6. An understanding of professional and ethical responsibility and the broad education and a knowledge of contemporary issues necessary to understand the impact of solutions in a global and societal context; and
7. A recognition of the need for and an ability to engage in life-long learning.
8. The professional characteristics expected of a successful Industrial Hygienist.

For admission into the M.S. Industrial Hygiene Program, applicants must meet department admission standards and ABET/ASAC prerequisite course requirements which are currently a minimum of sixty-three credit hours of approved science, mathematics, and other technical courses. Of these, at least fifteen credit hours must be junior or senior level. Specific pre/corequisite course requirements include two semesters of general/inorganic chemistry and two semesters of physics. On an individual basis, the faculty may identify additional pre/corequisite coursework, often including organic chemistry and biology. Applicants will be advised about their specific requirements at the time of admission. Applicants not meeting all of the listed requirements may be considered for admission as provisional students.

## Curriculum in Masters of Science – Industrial Hygiene

A candidate for the M.S. degree with a major in industrial hygiene must comply with the rules and regulations as outlined in the WVU Graduate Catalog and the specific requirements of the Statler College and the Industrial and Management Systems Engineering Department.

## Program Requirements

All M.S. degree candidates follow a planned program of study. The student's research advisor, in conjunction with the student's Advising and Examining Committee (AEC) will be responsible for determining the plan of study appropriate to the student's needs. Students must select a track (thesis or coursework only) by the end of their second semester in the program. Changes in track may be made later as needed. The underlying principle of the planned program is to provide the students with the necessary support to complete their degree and prepare them for their career.

## Curriculum Requirements

A minimum cumulative GPA of 3.0 is required in all courses

A minimum of 60% of courses must be from 500 level or above

### Course Requirements\*

|          |  |   |
|----------|--|---|
| STAT 511 | Statistical Methods 1                    | 3 |
| IH&S 460 | Ergonomics                               | 3 |
| IH&S 527 | Noise Measurement and Control            | 3 |
| IH&S 528 | Industrial Ventilation Design            | 3 |
| IENG 561 | Industrial Hygiene Engineering           | 3 |
| IH&S 725 | Industrial Hygiene Sampling and Analysis | 4 |
| OEHS 622 | Public Health Toxicology                 | 3 |
| EPID 601 | Public Health Epidemiology               | 3 |

Online short course : Basic Course in the Protection of Human Research Subjects - Biomedical Focus <https://www.citiprogram.org/default.asp>

**Complete 1 of the following options:** 9-11

### Thesis Option (9 Hours)

|                                    |                                     |
|------------------------------------|-------------------------------------|
| IH&S 693                           | Special Topics (Aerosol Mechanisms) |
| IH&S 697                           | Research (6 hours)                  |
| Written Proposal/Oral Presentation |                                     |
| Thesis                             |                                     |
| Final Oral or Written Examination  |                                     |

### Coursework Option (11 Hours)

|  |  |
|--|--|
| IENG 662   | Systems Safety Engineering               |
| OEHS 601   | Environmental Health                     |
| IH&S 685   | Internship                               |
| Environmental or Safety Elective: (choose one)** |  |
| ENVP 515   | Hazardous Waste Training                 |
| ENVP 555   | Environmental Sampling and Analysis      |
| SAFM 580   | Fundamentals of Environmental Management |
| SAFM 470   | Managing Construction Safety             |
| SAFM 533   | Disaster Preparedness                    |
| SAFM 534   | Fire Safety Management                   |
| Final oral or written examination                |  |

Total Hours 34-36

\* Students who do not hold a baccalaureate degree in industrial hygiene may be required to take a set of undergraduate courses above and beyond the minimum coursework requirements. Students must complete those courses and earn at least a "C" in each before completing the 18<sup>th</sup> credit hour in the industrial hygiene curriculum.

\*\* All courses contributing to Environmental or Safety Elective are three hours.

## Final Examination

M.S. students following the thesis option must prepare a written research proposal. The proposal must be approved by the student's AEC at least one semester prior to the final oral examination.

All students, regardless of option, are required to pass a final oral or written examination, administered by their AEC, covering the thesis and/or related course material.

## Suggested Plan of Study

The plan below illustrates the Thesis Option. It is important for students to take courses in the order specified as much as possible; all prerequisites and concurrent requirements must be observed. A typical M.S.I.H. degree program that completes degree requirements in two years is as follows.

### First Year

| Fall     | Hours Spring | Hours |
|----------|--------------|-------|
| STAT 511 | 3 IH&S 725   | 4     |
| IH&S 528 | 3 IH&S 527   | 3     |

|                    |                     |              |
|--------------------|---------------------|--------------|
| IENG 561           | 3 IH&S 697          | 3            |
|                    | 9                   | 10           |
| <b>Second Year</b> |                     |              |
| <b>Fall</b>        | <b>Hours Spring</b> | <b>Hours</b> |
| IH&S 460           | 3 OEHS 622          | 3            |
| IH&S 693           | 3 EPID 601          | 3            |
| IH&S 697           | 3                   |              |
|                    | 9                   | 6            |

Total credit hours: 34

## Major Learning Goals

### INDUSTRIAL HYGIENE

- An ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice such as:
  1. Principles and methods of industrial hygiene
  2. Principles and methods of ergonomics
  3. Principles and methods of safety
  4. Principles of environmental sciences
  5. Principles of epidemiology and biostatistics
  6. Principles and methods of control of physical and chemical hazards
- The ability to apply knowledge of math, science, and Industrial Hygiene;
- The ability to design and conduct experiments, analyze and interpret data, develop implementation strategies, and shape recommendations so that results will be achieved and findings will be communicated effectively;
- The ability to work individually, in teams, and/or in multi-disciplinary teams to identify, formulate, and solve problems using Industrial Hygiene, safety, and ergonomics knowledge, skills and tools;
- An ability to formulate or design a system, process, or program to meet desired needs;
- An understanding of professional and ethical responsibility and the broad education and a knowledge of contemporary issues necessary to understand the impact of solutions in a global and societal context;
- A recognition of the need for an an ability to engage in life-long learning;
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