

Occupational and Environmental Health Graduate Programs Handbook



HEALTH
UNIVERSITY OF UTAH



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1 Overview

1.1 Welcome

Welcome to the Occupational and Environmental Health Graduate Programs, which are primarily housed in the School of Medicine's Division of Occupational and Environmental Health (OEH) and include programs and faculty from multiple departments. Degrees offered include a Master of Occupational Health (MOH), a Master of Science in Occupational Health (MSOH), and Doctor of Philosophy (PhD) in Occupational and Environmental Health. Non-degree programs include a Graduate Certificate in Occupational Safety and Health. The Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) is an interdisciplinary, multi-university, trans-campus Education and Research Center (ERC) that provides support to students pursuing degrees in several areas of Occupational and Environmental Health and Safety (OEHS). It is one of 18 National Institute for Occupational Safety and Health (NIOSH)-sponsored ERCs responsible for training the U.S.'s graduate-level OEHS workforces. As of 2021, RMCOEH is also now legislatively designated as the first multi-university program in Utah. This groundbreaking law changed RMCOEH's structure into a partnership between Weber State University (WSU) and the University of Utah (UU), with the center reporting to both the UU Senior Vice President for Health Sciences and the WSU Provost. Graduate-level training in the OEH programs now includes WSU students in the OEH courses, and WSU faculty are also OEH program faculty.

Most of the RMCOEH and OEH program faculty are housed in the University of Utah's Division of OEH, the Department of Mechanical Engineering, the Department of Internal Medicine, the Department of Mining Engineering, and WSU's College of Health Professions.

1.2 Purpose and Scope

The purpose of the Graduate Student Handbook is to inform students of requirements and processes necessary to complete an OEH graduate degree program, as well as provide resources to enhance the student experience and help students achieve success. Additional information about policies, procedures, and resources available to graduate students is available through the Graduate School at the University of Utah.

1.3 Mission and Vision Statements

The University of Utah's mission is to foster "student success by preparing students from diverse backgrounds for lives of impact as leaders and citizens. We generate and share new knowledge, discoveries, and innovations, and we engage local and global communities to promote education, health, and quality of life. These contributions, in addition to responsible stewardship of our intellectual, physical, and financial resources, ensure the long-term success and viability of the institution."

The University of Utah School of Medicine's education mission is to serve "all people and communities of Utah and the Mountain West by intentionally supporting and improving individual and community health outcomes and quality of life."

The Division of Occupational and Environmental Health's vision is to improve OEHS by:

- Promoting OEHS wellness
- Educating OEHS health professionals
- Improving OEHS prevention
- Implementing evidence-based practice

The vision of RMCOEH is to "be the leading international Center in meeting current and future occupational and environmental health and safety challenges." The mission of both the Division of Occupational and Environmental Health and RMCOEH is to "protect workers and the environment through interdisciplinary education, research, and service."

2 Faculty and Staff

Faculty and staff are essential to ensuring student success. The names, roles, and contact information for staff who have roles directly relevant to students are presented in Table 1. Division of OEH and RMCOEH faculty with primary mentorship roles for students, including the ability to serve on OEH Graduate Programs student Supervisory Committees, are shown in Table 29 on page 86 of the Handbook. All members of the faculty in Table 29 have been pre-approved to serve on OEH student Supervisory Committees. However, only OEH faculty members that are tenure or tenure track can serve as the Committee Chair. Other faculty affiliated with the Division, the University of Utah, and/or other institutions and organizations may also potentially serve on Supervisory Committees with permission. Administrative roles filled by faculty are presented in Table 2.

Table 1. OEH and RMCOEH Administrative Staff Providing Student Support

Name and Title	Role	Contact Information
Ben Abbey Marketing Specialist	All things affiliated with RMCOEH marketing	ben.abbey@utah.edu
Christina Attridge Post Award	Manages grants received by RMCOEH and OEH	801-581-3532 christina.attridge@utah.edu
Marianne Bailey OEM Residency Program Coordinator	Coordinates Occupational and Environmental Medicine Residency	801-581-4096 marianne.bailey@hsc.utah.edu
Tiffany Baires OEH Director of Finance	OEH finances	tiffany.baires@utah.edu
Muridi Barow RMCOEH Administrative Assistant	Provides general administrative support, parking and travel assistance	801-581-7906 muridi.barow@utah.edu
Ian Boss RMCOEH IT Systems Administrator	Provides IT support	801-583-6412 ian.boss@utah.edu
Bubba Brown Creative Manager	Assists students with writing theses and dissertations, as well as with Journal Club	801-581-5056 bubba.brown@utah.edu
Ashly Buhler OEH Associate Director of Operations and Logistics	Manages OEH administration	ashly.buhler@hsc.utah.edu
Shawn Chanthapannah OEH Post Award Support	Manages OEH Grants	shawn.chanthapannah@hsc.utah.edu
Toni Chambers RMCOEH Administrative Assistant	Provides general administrative support, event planning, and building issues	801-581-8719 toni.chambers@hsc.utah.edu

Erika Chubac Pre-Award	Manages grants received by RMCOEH	erika.chubac@utah.edu
Kira Halls Computer Tech.	Provides IT support	kira.halls@utah.edu
Kate Hatcher OEH Administrative Assistant	Provides general administrative support, purchasing, travel assistance	801-213-5110 kate.hatcher@hsc.utah.edu
Kat McColl RMCOEH Graduate Academic Advisor	Oversees student advising, admissions, graduation, help with practicum	801-213-1077 kat.mccoll@utah.edu
Dallas Nelson OEH Graduate Academic Manager	Oversees student advising, admissions, registration, graduation	801-587-7896 dallas.nelson@utah.edu
Charles Schuknecht Multi-Media Content Specialist	RMCOEH marketing, with particular focus on multi- media channels	charles.schuknecht@utah.edu
Heidi Slack RMCOEH Associate Director	Provides financial support for the RMCOEH ERC grant, including stipends, tuition, fees, student reimbursements	801-581-7048 heidi.slack@utah.edu

Table 2. Primary Faculty Administrative Roles Relevant to Academic Programs

Title	Name
Chair, Division of Occupational and Environmental Health	Jeremy Biggs, MD
Director, Rocky Mountain Center for Occupational and Environmental Health	Kurt T. Hegmann, MD
Director, Occupational and Environmental Health Graduate Studies	Joseph Allen, PhD
Director, Ergonomics and Safety Program	Tommaso Lenzi, PhD
Director, Industrial Hygiene Program	Darrah Sleeth, PhD
Director, Mining Safety Program	Charles Kocsis, PhD
Director, Occupational Health Nursing Program	Jodi Waddoups, MSN-Ed
Director, Occupational Health Psychology Program	Joseph Allen, PhD
Director, Occupational Injury Prevention Program	Matthew Thiese, PhD
Director, Targeted Research Training Program	Maureen Murtaugh, PhD
Director, Occupational and Environmental Medicine Program and Occupational and Environmental Medicine Residency Program	Eric Wood, MD

3 Master of Occupational Health (MOH)

3.1 MOH Overview

The Master of Occupational Health (MOH) program is designed to train professionals who have either (i) a terminal degree (MD, DO, DVM, DDS, or PhD degree) or (ii) a bachelor's or other degree and experience in OEHS such as current employment with a goal to further their career in occupational health practice or research.

The MOH program currently includes the following approved emphases:

1. Ergonomics
2. Industrial Hygiene
3. Occupational Injury Prevention
4. Occupational and Environmental Medicine
5. Occupational Safety (in-person and online)
6. Occupational Health Psychology
7. General Occupational Health

The MOH program can be completed in two to three semesters of full-time study depending on the emphasis, ending with a summative examination. The University of Utah's Graduate School requires that all work to obtain a master's degree be completed within four consecutive calendar years. On recommendation of the student's Supervisory Committee, the Dean of the Graduate School may modify or waive this requirement. If the student exceeds the time limit and is not granted a modification or waiver, the OEH Graduate Programs have the option to discontinue the student. Students whose studies have been interrupted for long periods of time and who have been granted extended time to complete their degree may be required to (re)complete additional courses, pass examinations, or otherwise demonstrate currency in the field.

The MOH program does not require students to complete a research project. The MOH program does not require students to complete a research project. Traditional on-campus Occupational and Environmental Medicine residents, who complete the MOH degree in the first year of their training, are required to complete a research project as part of their residency, however.

3.2 MOH Program Requirements

3.2.1 Non-Credit Training Requirements

All students (other than online-only students) are required to attend an orientation (in person or virtually) for the Division of OEH/RMCOEH, which occurs at the beginning of the fall semester.

Students are required to complete the following forms and trainings as soon as possible upon enrollment. Students who are solely online, never enter the RMCOEH/OEH classrooms/offices, and are not conducting research with human subjects are only required to complete No. 1.

1. Graduate Student Conduct and Dismissal Policy (see below). Students that violate the Rules of Conduct are subject to dismissal from the MOH program, the Division of Occupational and Environmental Health, and the University of Utah.
2. Photo Video Release Form
3. HIPAA training
4. IRB (CITI) training
5. Introduction to Research Integrity
6. Defensive Driving Course

3.2.2 Advising and Program of Study Planning

Students will form a Supervisory Committee during the first semester of the MOH program. The Chair of the Supervisory Committee is the primary faculty mentor for the student, and will provide advising and mentorship regarding the development of the student's career plans.

Identification of the Chair and members of the Supervisory Committee will be guided by the Program Director for the MOH degree program emphasis in which the student is enrolled (see Table 2 above) and also requires approval of the OEH Graduate Studies Director. The University of Utah Graduate School requires that a master's-level Supervisory Committee have three members, with at least two being tenure-line faculty in the student's major department; however, RMCOEH/OEH have approval from the Graduate School for all full-time faculty in the OEH Graduate Programs to serve on Supervisory Committees (See Table 29).

The student is responsible for securing faculty members to serve on their Supervisory Committee. When the Supervisory Committee is formed, the student will report and submit the completed [Supervisory Committee Form](#) to the RMCOEH Graduate Academic Advisor and the Program Director.

The student will work with the RMCOEH Graduate Academic Advisor at the beginning of their first semester to develop a Program of Study that lists the courses that the student plans to take to meet the requirements for the MOH degree program. A [Program of Study Master's Form](#) will be maintained by the RMCOEH Graduate Academic Advisor and the student.

Due to time urgencies, students planning to complete the MOH in one year should ideally have the Program of Study developed and finalized prior to matriculation and, at the latest, within one month after matriculation.

Elective courses must be 6000 level or above and related to OEHS. Only courses numbered 6000 and above may be counted towards a graduate degree.

3.2.3 Summative Examination

A summative experience, such as a Summative Examination, is required by the University of Utah Graduate School for a graduate degree. The OEH Graduate Programs' Summative Examination meets this requirement and is administered at least twice a year, currently in November and April of each year. A satisfactory score is required for completion of the MOH degree. Students must complete the Summative Examination prior to graduation and no later than in the final examination period during the semester of planned graduation. Students must be registered for course credits in the semester during which the Summative Examination is taken.

The OEH Graduate Programs' Summative Examination is designed to be a standardized examination and consists of two components: (1) a core examination of common curricular elements across the OEH Graduate Programs emphases, and (2) for some programs, an emphasis-specific examination. The Summative Examination is intended to evaluate mastery of OEHS skills and knowledge from the curricular elements in the OEH Graduate Programs, and to prepare students for future professional certification examination(s) in their discipline. Students are allowed two attempts to pass the Summative Examination. Failure to pass will result in dismissal from the MOH program without awarding of the degree.

3.2.4 MOH Research Project

A research project is not required for any of the MOH degree emphases.

However, traditional on-campus Occupational and Environmental Medicine residents are required to complete a research project in the course of the OEM Residency Program.

3.3 MOH Course Requirements

3.3.1 Required MOH Courses

The MOH degree requires a minimum of 30 or more credit hours of coursework, depending on the emphasis, and is designed to be completed in two to four semesters.

3.3.2 Required Courses MOH with Ergonomics Emphasis

The Ergonomics emphasis requires eight core courses for a total of 24 credits. (See Table 3). The remaining nine credits are electives. Electives are chosen in consultation with the student's Supervisory Committee Chair and are determined based on the student's overall career objectives.

Table 3. Required Courses for the MOH with Ergonomics Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6761	Ergonomics	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6715	Occupational Safety and Solutions	3
MEEN 7100	Advanced Ergonomics	3
MEEN 6110	Introduction to Industrial Safety	3
Required Credits		24
Required Elective Credits		6
Total Credits		30

3.3.3 Required Courses MOH with Industrial Hygiene Emphasis

The Industrial Hygiene emphasis requires 10 core courses for a total of 30 credits (see Table 4).

Table 4. Required Courses for the MOH with Industrial Hygiene Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6761	Ergonomics	3
OEHS 6752	Introduction to Industrial & Environmental Toxicology & Physiology	3
OEHS 6754	Noise and Other Physical Agents (Offered alternate years)	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6751	Advanced Industrial Hygiene	3
OEHS 6753	Industrial Ventilation (Offered alternate years)	3
OEHS 6715	Occupational Health & Safety Solutions	3
Required Credits		30
Total Credits		30

3.3.4 Required Courses MOH with Occupational Injury Prevention Emphasis

The Occupational Injury Prevention (OIP) emphasis requires 10 core courses for a total of 30 credits (see Table 5).

Table 5. Required Courses for the MOH with Occupational Injury Prevention Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6703	Clinical and Behavioral Aspects of Occupational Injuries and Diseases	3
MEEN 6110	Introduction to Industrial Safety	3
OEHS 6761	Ergonomics	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 7720	Occupational Injury Epidemiology	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6810	Occupational Health Psychology	3
OEHS 6715	Occupational Health & Safety Solutions	3
Required Credits		30
Total Credits		30

3.3.5 Required Courses MOH with Occupational and Environmental Medicine Emphasis

The Occupational and Environmental Medicine emphasis for traditional (i.e., on-campus) OEM residents require 11 core courses for 33 credits (see Table 6). Online MOH OEM students must take 10 core courses for 30 credits, and OEHS 6810, Occupational Health Psychology, is taken in place of OEHS 6715. Online MOH OEM students are not required to take OEHS 6910.

Residents in Aerospace Medicine who are in the MOH program are also required to take Studies in Aerospace Medicine (OEHS 6706, five credit hours), in addition to the courses listed in Table 6.

Table 6. Required Courses for the Traditional OEM Residency’s MOH with Occupational and Environmental Medicine Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6703	Clinical and Behavioral Aspects of Occupational Injuries and Diseases	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6761	Ergonomics	3
OEHS 6702	Advanced Topics in Occupational and Environmental Health (2 credit course in fall and 2 credit course in spring)	4
OEHS 6752	Introduction to Industrial and Environmental Toxicology & Physiology	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6504	Clinical and Behavioral Aspects of Preventive Medicine	3
OEHS 6910	Project Research	2
OEHS 6715	Occupational Health and Safety Solutions	3
Required Credits		33
Total Credits		33

3.3.6 MOH OEM Program Competencies

1. Synthesize a foundation of knowledge in the etiology, treatment, and management of occupational injuries and disease on an individual and population-based level
2. Implement and effectively use state of the art medical guidelines and contemporary medical literature to assess health status of individuals
3. Summarize the contribution of and interaction between social, behavioral, and non-behavioral occupational injury and disease risk factors
4. Determine fitness for duty in compliance with applicable regulations and standards for safety sensitive work (e.g., DOT, firefighters, law enforcement officers, etc.)
5. Apply the elements of occupational biostatistics to utilize in research
6. Employ the principles of occupational epidemiology to utilize in research and analysis of medical literature
7. Utilize the principles of industrial hygiene and recognize the tools and instrumentation used for evaluation of the occupational environment
8. Develop the foundational expertise in ergonomics and safety including using the tools and instrumentation for evaluation of the occupational and physical environment
9. Acquire an understanding of the essentials of administration and management of health and safety programs to implement at an organizational level

10. Manage the impact of psychological conditions on ability to work and on the natural history of occupational and environmental injuries and illnesses
11. Distinguish the breadth, depth and impact that the specialty of Occupational and Environmental Medicine can have on both individuals and populations
12. Propose and implement skills to perform and execute an independent research project in a topic in occupational or environmental medicine

3.3.7 Required Courses MOH with Occupational Safety Emphasis, In-person and Online

The Occupational Safety emphasis requires 10 core courses for a total of 30 credits (see Table 7).

Table 7. Required Courses for the MOH with Occupational Safety Emphasis In-person and Online

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6761	Ergonomics	3
MGEN 6380	Mining Emergency Management & Emergency Technologies	3
MEEN 7110	Systems Safety	3
MEEN 6150	Introduction to Product Safety	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
MEEN 6110	Introduction to Industrial Safety	3
OEHS 6715	Occupational Health & Safety Solutions (in-person required)	3 OR
OEHS 6810	Occupational Health Psychology	3
Required Credits		30
Total Credits		30

The online MOH Occupational Safety emphasis requires the same courses as Table 7. Online MOH OS students take OEHS 6810, Occupational Health Psychology, in place of OEHS 6715 Occupational Health & Safety Solutions.

3.3.8 Required Courses for the MOH with Occupational Health Psychology Emphasis

The Occupational Health Psychology emphasis requires 10 courses for a total of 30 credits. (See Table 8).

Table 8. Required Courses for the MOH with Occupational Health Psychology Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 7810	Advanced Seminar Occupational Health Psychology	3
OEHS 7000	Applied Occupational Biostatistics II	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6761	Ergonomics	3
OEHS 6840	Methods in Occupational Health Psychology	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6810	Occupational Health Psychology	3
OEHS 6715	Occupational Health & Safety Solutions	3
Required Credits		30
Total Credits		30

3.3.9 Required Courses for the MOH with General Occupational Health Emphasis

The General Occupational Health emphasis requires six core courses for a total of 18 credits (see Table 8). The remaining 12 credits are electives. Electives are chosen in consultation with the student’s Supervisory Committee Chair and are determined based on the student’s overall career objectives.

Table 9. Required Courses for the MOH with General Occupational Health Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6761	Ergonomics	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6715	Occupational Health & Safety Solutions	3
Required Credits		18
Required Elective Credits		12
Total Credits		30

4 Master of Science in Occupational Health (MSOH)

4.1 MSOH Overview

The MSOH program is intended to train occupational health professionals for professional practice and/or transition to further research training. The MSOH degree is intended to be completed in two years of full-time study and requires students to:

- Complete required and elective courses (≥ 42 credit hours)
- Complete ≥ 240 hours of a practical OEHS field experience (i.e., Practicum) (not required for MSOH Ergonomics or MSOH Safety emphases)
- Pass the OEH Graduate Programs' Summative Examination (not required for students in the MSOH-IH emphasis)
- Complete a research-based project involving a substantive written scholarly work product and oral defense presentation

Students in the MSOH program select an emphasis in one of the following approved areas:

1. Industrial Hygiene
2. Ergonomics
3. Occupational Safety
4. Occupational Injury Prevention
5. Occupational Health Psychology
6. Mining Safety
7. General Occupational Health

The University of Utah Graduate School requires that all work to obtain a master's degree be completed within four consecutive calendar years. On recommendation of the student's Supervisory Committee, the Dean of the Graduate School may modify or waive this requirement. If the student exceeds the time limit and is not granted a modification or waiver, the OEH Graduate Degree Programs have the option to discontinue the student. Students whose studies have been interrupted for long periods of time and who have been granted extended time to complete their degree may be required to (re)complete additional courses, pass examinations, or otherwise demonstrate currency in the field.

4.2 General MSOH Program Requirements

4.2.1 Non-Credit Training Requirements

All students are required to attend a combined orientation (in person or virtually) for the Division of OEH/RMCOEH, which occurs at the beginning of the fall semester.

The following forms and trainings are required to be completed by all students as soon as possible upon enrollment:

1. Graduate Student Conduct and Dismissal Policy (See below). Students that violate the Rules of Conduct are subject to dismissal from the MSOH program, the Division of Occupational and Environmental Health, and the University of Utah.
2. Photo Video Release Form
3. HIPAA training
4. IRB (CITI) training
5. Introduction to Research Integrity
6. Defensive Driving Course

Students funded by RMCOEH are required to attend the National Occupational Research Agenda New/Young Investigators Symposium (NORA), which is hosted by RMCOEH each April. Students are strongly encouraged to work with the student's Supervisory Committee Chair and submit abstracts for posters or oral presentations at this symposium.

4.2.2 Non-Credit Activity Opportunities

Journal Club

All RMCOEH trainees are required to present twice during each academic year: once at a Traditional Journal Club, which are typically held weekly and once at a Flash Journal Club, which are held on certain dates throughout the academic year. Residents in the OEM program have additional requirements (see below).

Traditional Journal Club

- RMCOEH trainees must attend at least 70% of Traditional Journal Clubs either in person or online. Trainees attending online must have their cameras on.
- Trainees will have the ability to make up attendance for a Journal Club by watching a recording of the session and writing a one-page report. Trainees must turn in the report within one week (prior to the next journal club) to receive credit. The report must include:
 - A summary of both articles presented. The summaries should be brief but sufficiently demonstrate that the trainee read each article in addition to watching the recording of the Journal Club.
 - A brief summary of each presenter's opinion of, and insight into, the article they chose.
 - The trainee's own opinion regarding the studies. Do the data justify the authors' conclusions? Were there flaws in the study design? How could the research have been conducted differently or better?
- All trainees are expected to regularly participate in the Journal Club discussions. This includes online attendees, who will be given explicit opportunities to provide comments.

Flash Journal Club

- One-hour Flash Journal Clubs will be held five times throughout the academic year, with 10 students presenting during each one. The aim is to help trainees develop the practical skill of concisely conveying complicated information.
- All RMCOEH trainees are required to present in one Flash Journal Club.
- Presenters will be given five minutes to present a journal article and discuss the key elements of the research and the student's opinion of the paper.

Clinical Journal Club

- In addition to meeting the above requirements, OEM residents must also present twice during the academic year in separate, clinical-specific Journal Clubs. Only residents present in these, but trainees and faculty of all programs are welcome and encouraged to attend.

American Society for Safety Professionals (ASSP) – University of Utah Chapter

This is a student-run chapter with a faculty advisor and student officers. Student membership in ASSP is available and encouraged for students in all emphases. Students have regular meetings, social events, guest presentations, and networking events, as well as opportunities to participate in professional chapter and national meetings.

Utah Rocky Mountain Center Industrial Hygiene Student Association

This is a student-run organization recognized as a Sponsored Student Organization by the University of Utah. It is also recognized by the American Industrial Hygiene Association (AIHA) as a student chapter. Students have regular meetings, social events, guest presentations, and networking events, as well as opportunities to participate in professional chapters and national meetings.

Occupational Injury Prevention Student Group

Affiliated with RMCOEH, the Occupational Injury Student Group is a student-sponsored organization. The aim of the organization is to increase awareness of the field to other graduate and undergraduate students, promote the work of students through conferences and other opportunities, and provide resources for students within the program.

4.2.3 Advising and Programs of Study

Students will form a Supervisory Committee during the first semester, and no later than the second semester, of the MSOH program. The Chair of the Supervisory Committee is the primary advisor for the student and will guide the student with respect to developing a Program of Study and selecting a topic for the research project. The Supervisory Committee may require supplementary courses for which no graduate credit is granted to address deficiencies in a student's undergraduate training.

Identification of the Chair and members of the Supervisory Committee will be guided by the Program Director for the MSOH degree program emphasis in which the student is enrolled. The University of Utah Graduate School requires that the Supervisory Committee have three members, with at least two being tenure-line faculty in the student's major department; however, RMCOEH/OEH has approval from the Graduate School for students to include any full-time faculty member in the OEH Graduate Programs (See Table 29).

When the Supervisory Committee is formed, the student will report and submit the completed [Supervisory Committee Form](#) to the RMCOEH Graduate Academic Advisor and the Program Director.

Students will work with the Chair of the student's Supervisory Committee to develop a Program of Study that describes the courses the student plans to take to meet the requirements of the student's MSOH degree program emphasis. Copies of the [Program of Study Master's Form](#) will be maintained by the RMCOEH Graduate Academic Advisor and the student.

The MSOH degree requires ≥ 42 credit hours of courses. The 42 credit hours include three credit hours of mentored, applied practical experience related to occupational health (≥ 240 hours in the field, i.e., the Practicum) and three credit hours of research for the final research project. The remaining 36 credit hours includes required and elective courses, which vary among the MSOH emphases. To count towards the 42-credit hour requirement, other elective courses must be 6000 level or above, be approved by the student's Supervisory Committee, and be related to OEHS. Only courses numbered 6000 and above count towards a graduate degree.

4.2.4 Practicum (Internship)

Academic Credit

All students in the MSOH degree program must complete \geq three credit hours (OEHS 6800; equal to ≥ 240 hours of fieldwork) of a Practicum prior to graduation. One credit hour is equal to 80 contact hours of practical experience. If working full time (40 hours per week), a student can complete the required contact hours in six weeks. If working part-time (20 hours per week), a student can complete the required hours in 12 weeks, or approximately one semester.

If necessary, and only with written advance approval from the OEHS 6800 course director, the Practicum experience may occur over multiple academic terms (fall, spring, or summer). Academic credit should be taken in each relevant academic term during which the Practicum occurs and can be taken no later than the term following the completed Practicum, with the credit hours reflecting the hours of field work.

Learning Objectives

The Practicum is meant to give students direct, hands-on experience working as an occupational health professional and applying the knowledge and skills acquired in the classroom. The Practicum also prepares students for employment after completion of the degree. While research may be part of the Practicum, it is not required and should not be the primary aspect. The learning objectives of the Practicum are:

- Integrate foundational occupational health knowledge with a concrete experience of occupational health practice, usually focused on a specific discipline. In particular, to observe and report how the following concepts play out in an occupational health practice:
 - The core functions of occupational health
 - The core organizational practices necessary for governmental agencies to carry out the mission of protecting the health of workers
 - The essential occupational health services from an organization or community-based perspective
- Identify and report issues relevant to a specific Practicum site and how they play out in occupational health practice
- Identify growth areas in occupational health practice
- Broaden knowledge and skills in occupational health practice

Placement Criteria and Process

Students should complete the Practicum at sites where occupational health practice occurs and that are relevant to the student's OEH program emphasis and career goals. Plausible sites include, but are not limited to: industrial sites, governmental agencies (OSHA, CDC/NIOSH, etc.), OEHS activities within health departments, universities, labor unions or worker centers, non-governmental organizations with an occupational health mission (e.g., Center to Protect Workers' Rights, etc.), worker's compensation insurance companies, and health care organizations focusing on occupational health and safety. A Practicum site should meet the following criteria:

1. The organization or part of the organization should be engaged in the practice of occupational health, preferably in an occupational health discipline related to the student's degree program (e.g., industrial hygiene, ergonomics, etc.).
2. The work opportunity must include hands-on, practicum experience with the occupational health practice at the site. Activities might include: performing exposure assessments, training workers, hazard communication, performing audits, developing or implementing an intervention, etc.
3. The mentor at the site must be qualified by experience and education to supervise and evaluate the student's performance and experience and must be available to the student on a regular basis during the Practicum. For students in the MSOH-Industrial Hygiene emphasis, the mentor should ideally be a Certified Industrial Hygienist. For students in the MSOH-Occupational Safety emphasis, the mentor should ideally be a Certified Safety Professional.

A list of sites where students have previously completed a Practicum and current advertisements will be available to students from the RMCOEH Graduate Academic Advisor or the OEHS 6800 Course Director. If a student identifies another site, they must inform the Chair of their Supervisory Committee and the OEHS 6800 Course Director at least one semester prior to the planned start date. If a student will not become an employee at the site, a contract must be executed between the University of Utah and the site to ensure protection of the student at the site. Ultimately, the Practicum site must be approved by the Chair of the Supervisory Committee, the Program Director (if not the Supervisory Committee Chair), and the proposed mentor at the site.

Timing and Logistics

Most students complete the Practicum during the summer after their first year in the MSOH degree program and work at the site full time, but some students complete the Practicum during the fall or spring semesters and work at the site part time. It is recommended that the student complete one to two semesters of study before the Practicum so that the student has acquired sufficient skills and knowledge to engage in and contribute to activities at the site. Students in the MSOH-Industrial Hygiene emphasis must complete OEHS 6751 (Advanced Industrial Hygiene) before starting the Practicum.

Three or four months prior to the anticipated start date, the student should begin to identify the industry or organization where they wish to have the Practicum. Prior to beginning the experience (by April 15th for a Practicum in the summer), students must submit the following documents to the OEHS 6800 Course Director:

1. Statement of student's goals and objectives for the experience
2. Mentor Credential Form

4.2.5 Summative Examination

The OEH Graduate Programs' Summative Examination is administered in November and April of each year, and a satisfactory score is required for completion of some emphases for the MSOH degree (e.g., not the MSOH-IH emphasis; check with the RMCOEH Graduate Academic Advisor). The Summative Examination is intended to evaluate mastery of OEHS skills and knowledge from the common curricular elements in the MSOH degree programs and to prepare students for future certification examinations in the student's OEHS discipline. Students should plan to take the Summative Examination one semester prior to their planned graduation in case they are unsuccessful on the first attempt. Students are allowed two attempts to pass the examination. Failure to pass the examination on the second attempt will result in dismissal from the MSOH program.

The Summative Examination has two parts: a core content component and a discipline-specific component. The core examination component consists solely of multiple-choice questions constructed in a standardized style covering material addressed in core courses (e.g., occupational epidemiology, biostatistics, and management/administration). The

second part of the examination is comprised of questions specific to the student's emphasis and may include short-answer essay and multiple-choice questions.

According to University of Utah Graduate School policies, students must be registered in courses for the semester during which the Summative Examination is taken. Additionally, the Summative Examination must be taken before the conclusion of the final exam period.

4.2.6 Research Project

General Information

The MSOH degree is a research-oriented master's degree, and all MSOH students are required to complete and successfully defend a research project prior to graduating. Students must:

1. Choose a research project that coincides with the student's research interests
2. Create a Supervisory Committee consisting of faculty and/or experts in the specified research area
3. Complete at least three credit hours of research project/thesis (OEHS 6910/6911)
4. Write either: 1) a paper in the format of a traditional thesis or 2) an academic paper that would be suitable for publication in a scientific journal (non-thesis research project). The academic paper requires the student to work with their Supervisory Committee to determine a target journal and thus the specific formatting in which the article must be written. MOST students opt to pursue a scientific paper rather than a thesis.
5. Present and successfully defend the research project at a public seminar
6. Submit for publication in an academic journal (if applicable)

It is recommended that students begin contemplating their research project in their first semester. This will allow adequate time to: develop a specific research question, identify and gain rapport with faculty who share that research interest, and secure agreements from faculty to serve on the student's Supervisory Committee.

Topic and Scope

The research project must be on a topic related to the MSOH emphasis in which the student is enrolled. The project must involve a systematic investigation to establish new facts and reach new conclusions. Primary data collection is strongly encouraged but not required. In select cases, systematic analysis of existing data, including literature, to answer a new research question may be acceptable. The scope of the research project should be equivalent to one scientific paper.

The student's Supervisory Committee will determine whether the research project topic and scope are appropriate. Prior to starting the research project, a student must prepare a Concept Proposal that requires approval by the student's Supervisory Committee (**see**

[Proposal Approval Form](#)). A brief list of what the Concept Proposal should cover is provided below. A template is available from the RMCOEH Graduate Academic Advisor. A copy of the final Concept Proposal will also be placed in the student's file. Students are asked to return the student's proposal to the Graduate Academic Advisor.

The Concept Proposal (~1 page) should include the following:

- Title
- Student name
- Supervisory Committee member names
- Advisor/consultants
- IRB approval status
- Background on the topic – may involve brief literature search
- Study question – a one-sentence question that research project will answer
- Study population – brief description of study population
- Study methods – brief description of the methodology, including (if relevant) study design, outcomes/exposure variables, description of database, inclusion/exclusion criteria, equipment to be used, sample size, etc.
- Statistical methods – description of the proposed statistical methods for analysis
- Potential OEH implications – description of why the study is important to OEH and how the field will benefit from the research

Form the Supervisory Committee

The student is responsible for identifying members of their Supervisory Committee, including the Chair, with whom they will work on the research project. The [Supervisory Committee Form](#) must be submitted to the RMCOEH Graduate Academic Advisor. One member of the Supervisory Committee must be from a discipline/emphasis other than the one in which the student is seeking training to ensure interdisciplinary experiences in this aspect of training. The essential role of the student's Supervisory Committee is to provide feedback, guidance, and mentorship on the research project while also assessing successful completion of the research subject and judging the student's final Defense.

Following University of Utah Graduate School policy, "Master's Supervisory Committees consist of three faculty members, the majority of whom must be tenure-line faculty in the student's major department." The student's Supervisory Committee Chair and one Committee member must have tenure or be on tenure track from the Division of OEH or approved by the Graduate School; however, RMCOEH/OEH has Graduate School approval for any of the full-time OEH faculty to serve on a student's Supervisory Committee (see Faculty Table on page 85). If a student desires someone outside the OEH Graduate Programs to serve on their Supervisory Committee, the potential Committee member must: hold a minimum of a master's degree, have expertise specific to the research topic, and be approved by both the student's Supervisory Committee Chair and the OEH Graduate Studies Director. The desired outside member must submit a CV to the RMCOEH Graduate Academic Advisor for Graduate School records.

Research Project Credit Hours (OEHS 6910/6911)

Before a student can register for research project hours, they must set up a Supervisory Committee and turn in a completed [Supervisory Committee Form](#), with the appropriate signatures, to the RMCOEH Graduate Academic Advisor. After completion of those steps, a permission code will be provided that will allow the student to register for OEHS 6910/6911 (Project Research/Project Thesis). Students must be sure to sign up for the section associated with the student's Supervisory Committee Chair. The student must register for a total of three credit hours towards the research project before graduation. Please note that it does not matter when a student registers for those credits, as it can be during or after completing the required project hours. The three credits may be split into multiple semesters as needed. Please note: Students must be registered for at least three credit hours, whether research project credits or another academic class, during the semester of the student's final research project Defense.

Conduct Your Research and Produce a Written Work Product

After the approval of the student's research project concept proposal, the student may proceed with developing their research under the direction of the Supervisory Committee. Approval of any and all of the content of the research project is an academic matter between the student and their Supervisory Committee.

For a student who chooses to complete a traditional thesis instead of an academic paper for publication in a scientific journal, the form and distribution for the thesis and abstract, as well as the use of restricted data, are outlined in "A Handbook for Theses and Dissertations," (<https://gradschool.utah.edu/thesis/handbook/index.php>) available from the Graduate School. In that case, the format of the thesis must be approved by the Graduate School thesis and dissertation editor, Room 302 Park Building. Please see the Graduate School calendar (<https://gradschool.utah.edu/thesis/handbook/index.php>) for critically important information about deadlines, which are generally much earlier than is required for the academic paper format.

Students pursuing an academic paper for publication in a scientific journal, meanwhile, should format their work as a manuscript ready for peer review. More details are provided in Section B.3, but in general the manuscript should have the following sections:

- Abstract
- Introduction
- Methods
- Results
- Discussion
- Conclusions
- References

The manuscript should include roughly four to seven informative tables or figures and relevant, current references from the peer-reviewed literature and authoritative bodies (e.g., CDC/NIOSH, EPA, etc.).

Final Oral Examination/Defense

The student must provide a practice defense (i.e., a “Pre-Defense”) of their research project to their Supervisory Committee. This includes submitting PowerPoint slides and other supporting exhibits for the presentation. At the Pre-Defense, the student’s Supervisory Committee provides a robust critique to the student, which may lead to requirements for additional research to be conducted, analyses to be performed, and/or changes that may be required prior to proceeding to the final Defense.

The final Defense of the research project is an oral examination, and it cannot be scheduled until the student’s Supervisory Committee explicitly agrees that all of the elements of the research appear to be both presentable and defensible. The student’s final Defense is classified by the University of Utah as a public seminar. Thus, in compliance with requirements from the Graduate School, the date and time of the final Defense must be widely posted at least 10 days in advance. Electronic dissemination through list-servs, RMCOEH social media platforms and the RMCOEH website is required. It is also recommended to post flyers at the entrances to office and classroom areas at RMCOEH and the Division of Occupational and Environmental Health and on the bulletin board of the Ergonomics and Safety Program in the Department of Mechanical Engineering.

After the final Defense, the student’s Supervisory Committee indicates on the [Report of the Final Examination Form](#) whether the student has passed or failed. This form is due by the last day of the semester in which the student expects to graduate. All of the student’s Supervisory Committee members who are in person at the final Defense must sign the form. Committee members attending virtually need to sign the form electronically. In cases where the student’s Supervisory Committee does not feel that the student has passed the Defense, the Committee will make appropriate specific recommendations for further courses, reading, or research to address the deficiencies. For the research project to be considered final, the student must provide a final draft of the written product to their Supervisory Committee Chair, including PowerPoint slides, and all data/codes. For a thesis to be considered final, the student must have completed all edits from the Supervisory Committee and finalize format editing with the Graduate School Thesis Office.

Publication of Academic Paper

For the majority of students who choose to pursue an academic paper suitable for a scientific journal, the goal is to have the paper accepted for publication in a journal in order to publicly share the results of the research. The student’s Supervisory Committee can help determine appropriate journal(s) to target for submission. Typically, the student is required to prepare their paper in the format of the target journal approved by the Supervisory Committee.

Authorship of a student's academic paper will usually include the student as first author, followed by the student's Supervisory Committee members and others who meaningfully contributed to the research. If the student fails to adhere to the agreed-upon timeline for journal submissions, the student may forfeit their role as first author, and the Supervisory Committee chair can assume leadership in getting the manuscript successfully published (see below). If the student does not submit to the journal while a student in the OEH Graduate Programs, and especially if the work of submission falls to the faculty member(s), then the student will generally be moved from first author to another position in the sequence of authors.

In some cases, the Supervisory Committee chair may determine that the work product is not suitable for submission for publication in a peer-reviewed journal. This may be due to limited sample size, major deficiencies in the methods, or other factors. Generally, this will not prevent the student from proceeding to their final Defense. The final Defense presentation and written work product serve as the demonstration of research mastery for purposes of graduation. In other words, submission and acceptance of the academic paper for publication are not requirements for completion of the MSOH degree.

4.3 MSOH with Industrial Hygiene Emphasis

4.3.1 Accreditation

The MSOH Industrial Hygiene emphasis is externally accredited by the Accreditation Board for Engineering and Technology, Inc. (ABET). Students completing the program are prepared to sit for the Board for Global EHS Credentialing examination to become a Certified Industrial Hygienist (CIH). Successful completion of the ABET-accredited MSOH-IH degree reduces by one year the time needed in professional practice before a graduate is eligible to sit for that exam.

4.3.2 Program Educational Objectives

Within three to five years of graduation, graduates from the MSOH Industrial Hygiene emphasis are expected to:

1. Engage with professional societies
2. Apply skills to benefit the health and safety of workers and communities
3. Recruit diverse individuals into the profession through outreach and mentorship
4. Seek professional certification and recognition
5. Engage in lifelong learning
6. Collaborate in multidisciplinary teams
7. Translate research into practice
8. Demonstrate ethical principles
9. Communicate with a broad range of audiences

4.3.3 Program Competencies

Graduates from the MSOH Industrial Hygiene emphasis will be able to:

1. Anticipate, recognize, and identify hazards based on fundamental principles, existing knowledge, and surveillance
2. Apply qualitative and quantitative methods to assess exposure to occupational and environmental hazards
3. Recommend solutions to occupational and environmental health and safety problems with consideration of the hierarchy of controls, regulations, scientific principles, effectiveness, and feasibility
4. Design and evaluate occupational and environmental health and safety management programs with consideration of regulations, continuous process improvement
5. Articulate the value of occupational health and safety to organizations and workers
6. Analyze and interpret diverse data related to occupational and environmental health and safety, including: exposure assessment data, epidemiologic data, and experimental data
7. Conduct applied research activities
8. Communicate occupational and environmental health and safety information with technical competency to diverse audiences
9. Engage in interdisciplinary teams to solve occupational and environmental health and safety problems
10. 10. Apply ethical principles to occupational and environmental health and safety problems, research, and professional practice

4.3.4 Course Requirements

The Industrial Hygiene Emphasis requires 12 core courses for a total of 30 credits (see Table 10). The remaining credits are for Practicum (3 credits), research (3 credits), and electives (6 credits). Electives are chosen in consultation with the student's Supervisory Committee Chair and are determined based on the student's overall career objectives.

Table 10. Required Courses for the MSOH Industrial Hygiene Emphasis.

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6754	Noise and Other Physical Agents with laboratory (Offered alternate years)	3
OEHS 6751	Advanced Industrial Hygiene	3
OEHS 6752	Introduction to Industrial and Environmental Toxicology & Physiology	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6761	Ergonomics	3
OEHS 6753	Industrial Ventilation (Offered alternate years)	3
OEHS 6715	Occupational Health and Safety Solutions	3
Required Credits		30
Research Credits (OEHS 6910)		3
Practicum (OEHS 6800)		3
Required Elective Credits		6
Total Credits		42

4.4 MSOH Occupational Injury Prevention (OIP) Emphasis Course Requirements

4.4.1 Program Competencies

1. Demonstrate knowledge of principles and research methods in OEHS and occupational injury prevention
2. Participate in conceiving, designing, and/or conducting original research that advances knowledge or practice in OIP
3. Convey scientific and technical information to diverse audiences through effective writing or oral communication
4. Engage with interdisciplinary teams and the scientific community
5. Disseminate OIP-specific research findings or educational content to students, professionals, the public, or non-academic organizations
6. Apply principles of ethics to occupational and environmental health

4.4.2 Course Requirements

The MSOH Occupational Injury Prevention (OIP) emphasis requires nine core courses for a total of 27 credits (see Table 11). The remaining credits are for Practicum (3 credits),

research (6 credits), and electives (6 credits). Electives are chosen in consultation with the student’s Supervisory Committee Chair and are determined based on the student’s overall career objectives.

Table 11. Required Courses for the MSOH Occupational Injury Prevention Emphasis

Course #	Course Title	Credits
OEHS 6810	Occupational Health Psychology	3
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6703	Clinical and Behavioral Aspects of Occupational Injuries and Disease	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 7720	Occupational Injury Epidemiology	3
OEHS 6715	Occupational Health and Safety Solutions	3
OEHS 6761	Ergonomics	3
Required Credits		27
Practicum Credits (OEHS 6800)		3
Research Credits (OEHS 6910)		6
Required Elective Credits		6
Total Credits		42

4.5 MSOH Ergonomics Emphasis Course Requirements

4.5.1 Program Competencies

1. Summarize basic human physical capabilities and limitations and apply this knowledge to the reduction of injury potential for individuals in the work force, the elderly, and individuals with disabilities.
2. Articulate basic musculoskeletal injury causation theory and identify methods to minimize injury potential across the workplace.
3. Design and implement effective human-workplace systems that minimize worker injury risk without compromising system performance.
4. Adapt existing ergonomic tools and methods to develop and increase accessibility to individuals with varying types of disabilities and the elderly.

4.5.2 Course Requirements

The MSOH Ergonomics emphasis requires seven core courses for a total of 21 credits (see Table 12). The remaining credits are for research (6 credits) and electives (15 credits). Electives are chosen in consultation with the student’s Supervisory Committee Chair and are determined based on the student’s overall career objectives.

Table 12. Requirements for the MSOH Ergonomics Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6761	Ergonomics	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
MEEN 7100	Advanced Ergonomics or Introduction to Biomechanics (MEEN 6535)	3
OEHS 6715	Occupational Health and Safety Solutions	3
Required Credits		21
Research Credits (OEHS 6910)		6
Required Elective Credits		15
Total Credits		42

4.6 MSOH Occupational Safety Emphasis Course Requirements

4.6.1 Program Competencies

1. Perform a basic accident investigation and recommend corrective actions.
2. Develop skills to reduce the frequency of accidents and the severities of injuries.
3. Understand the responsibility of engineers and other professionals in product and process design to think critically and act ethically.
4. Identify and evaluate potential sources of injuries and illness through hazard and risk analyses using the appropriate methods.
5. Differentiate simple compliance-based from risk-based safety and health approaches.
6. Solve current and future safety and health problems.
7. Serve the workforce and society as a competent and responsible safety and health engineer and professional.

4.6.2 Course Requirements

The MSOH Occupational Safety emphasis requires eight core courses for a total of 24 credits (see Table 13). The remaining credits are for research and electives. Electives are chosen in consultation with the student's Supervisory Committee Chair and are determined based on the student's overall career objectives.

Table 13. Required Courses for the MSOH Occupational Safety Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6761	Ergonomics	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
MEEN 6110	Introduction to Industrial Safety	3
MEEN 7110	Systems Safety or Product Safety (MEEN 6150)	3
OEHS 6715	Occupational Health and Safety Solutions	3
Required Credits		24
Research Credits (OEHS 6910)		6
Elective Credits		12
Total Credits		42

4.7 MSOH Occupational Health Psychology Emphasis Course Requirements

4.7.1 Program Competencies

1. Demonstrate knowledge of principles and research methods in OEHS and occupational health psychology.
2. Participate in conceiving, designing, and/or conducting original research that advances knowledge or practice in OHP.
3. Convey scientific and technical information to diverse audiences through effective writing or oral communication.
4. Engage with interdisciplinary teams and the scientific community.
5. Disseminate OHP-specific research findings or educational content to students, professionals, the public, or non-academic organizations.
6. Apply principles of ethics to occupational and environmental health.

4.7.2 Course Requirements

The MSOH Occupational Health Psychology (OHP) emphasis requires 10 core courses for a total of 30 credits (see Table 14). The remaining credits are for Practicum (3 credits), research (6 credits), and electives (3 credits). Electives are chosen in consultation with the student's Supervisory Committee Chair and are determined based on the student's overall career objectives.

Table 14. Required Courses for the MSOH Occupational Health Psychology Emphasis

Course #	Course Title	Credits
OEHS 6810	Occupational Health Psychology	3
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6840	Methods in Occupational Health Psychology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 7000	Applied Occupational Biostatistics II	3
OEHS 6715	Occupational Health and Safety Solutions	3
OEHS 6761	Ergonomics	3
OEHS 7810	Advanced Seminar in Occupational Health Psychology	3
Required Credits		30
Practicum Credits (OEHS 6800)		3
Research Credits (OEHS 6910)		6
Required Elective Credits		3
Total Credits		42

4.8 MSOH Mining Safety Emphasis Course Requirements

4.8.1 Program Competencies

1. Understand the fundamental principles of occupational health and safety within the mining industry, including legal requirements, regulations, and standards.
2. Participate in conceiving, designing, and/or conducting original research that advances knowledge or practice in Mining Safety.
3. Engage with interdisciplinary teams and the scientific community.
4. Apply risk assessment methodologies to identify, evaluate, and control hazards specific to mining operations, ensuring the safety of workers and the surrounding environment.
5. Develop comprehensive emergency response plans and strategies to effectively manage and mitigate potential mining-related incidents and emergencies.
6. Analyze and interpret data related to occupational health and safety in mining, employing statistical and analytical techniques to identify trends and patterns for continuous improvement.
7. Utilize advanced technology and tools, such as drones, sensors, and virtual reality, to enhance safety practices and monitor mining operations in real-time.
8. Design and implement effective training programs for mining personnel, covering topics such as hazard recognition, personal protective equipment (PPE), and safe work practices.

9. Collaborate with industry stakeholders, government agencies, and communities to address social, environmental, and ethical concerns related to mining health and safety.
10. Communicate effectively, both orally and in writing, on mining health and safety topics, disseminating research findings, and advocating for best practices within the mining industry.

4.8.2 Course Requirements

The MSOH Mining Safety emphasis requires eleven core courses for a total of 27 credits (see Table 15). The remaining credits are for Practicum (3 credits), research (6 credits), and electives (6 credits). Electives are chosen in consultation with the student’s supervisory committee chair and are determined based on the student’s overall career objectives.

Table 15. Required Courses for the MSOH Mining Safety Emphasis

Course #	Course Title	Credits
MGEN 6350	Mining Health & Safety Hazards and Controls	3
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
MGEN 6050	Mining Ventilation & Underground Environmental Control	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
MGEN 6380	Critical Risk Management: Preventive Mining Injuries & Fatalities	1
OEHS 6715	Occupational Health and Safety Solutions	3
OEHS 6761	Ergonomics	3
MGEN 6340	Mining Safety Leadership & Culture: Human Centered Design	1
MGEN 6390	Mining Emergency Management & Emergency Technologies	1
Required Credits		27
Practicum Credits (OEHS 6800)		3
Research Credits (OEHS 6910)		6
Required Elective Credits		6
Total Credits		42

4.9 MSOH General Occupational Health Emphasis Course Requirements

The General Occupational Health emphasis requires seven core courses for a total of 21 credits (see Table 16). The remaining credits are for practicum (3 credits), research (6 credits), and electives (12 credits). Electives are chosen in consultation with the student’s Supervisory Committee Chair and are determined based on the student’s overall career objectives.

Table 16. Required Courses for the MSOH General Occupational Health Emphasis

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6761	Ergonomics	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
MEEN 6110	Introduction to Industrial Safety	3
OEHS 6715	Occupational Health and Safety Solutions	3
Required Credits		21
Practicum Credits (OEHS 6800)		3
Research Credits (OEHS 6910)		6
Elective Credits		12
Total Credits		42

4.10 Summary of Important Dates, Guidelines, and Milestones

Table 15 summarizes key milestones for the MSOH degree program based on matriculation in fall. Students in all emphases of the MSOH degree program who receive funding from RMCOEH's NIOSH grant are required to attend the National Occupational Research Agenda (NORA) New/Young Investigators Symposium hosted by RMCOEH in April each year. Students in the OEH Graduate Programs emphases in IH, Ergonomics, and Safety are also required to attend the Annual Utah Conference on Safety & Industrial Hygiene, which occurs in the Salt Lake City area each October.

Students are also encouraged to attend regional and national professional meetings such as:

- American Industrial Hygiene Conference & Expo, which occurs at different locations around the United States or Canada in May or early June of every year
- American Society of Safety Professionals Conference, typically held in September
- American Occupational Health Conference, typically in April or May

Both RMCOEH and faculty research grants may have funding to help support student attendance and presentation at select regional/national meetings.

Table 17 Guidelines and Milestones for Efficiently Completing the MSOH Degree Program

Semester 1	Semester 2
<ul style="list-style-type: none"> • Explore and identify research project topic • Form Supervisory Committee and document the Committee with the RMCOEH Graduate Academic Advisor • <u>Complete Program of Study Master's Form</u> • Arrange for Practicum 	<ul style="list-style-type: none"> • Submit 1-page research concept proposal to the Supervisory Committee • Consider Dissertation Bootcamp hosted by RMC/OEH Senior Technical Writer
Semester 3	Semester 4
<ul style="list-style-type: none"> • Conduct research project and begin drafting the academic paper or thesis • Strongly advised to participate in the Dissertation Bootcamp hosted by RMCOEH Senior Technical Writer • Take Summative Examination, if required 	<ul style="list-style-type: none"> • Apply for graduation through the student's CIS account • Prepare and practice oral presentation of research project/thesis • Schedule Pre-Defense • Final Defense of research project • Complete and submit academic paper to the target journal/submit thesis to Graduate School Thesis Office

5 Doctor of Philosophy (PhD) in Occupational & Environmental Health

5.1 Overview

The Doctor of Philosophy (PhD) in OEH trains individuals to conduct research in OEHS by developing in-depth knowledge in an area of occupational and environmental health and research skills. PhD graduates are prepared to pursue careers as researchers and leaders in academia, governmental organizations, large corporations, and other types of institutions.

There are four emphases in the PhD program:

1. **General Occupational and Environmental Health.** The Occupational and Environmental Health emphasis allows students to develop a course of study that meets their specific academic, research, and career interests, including research focused on environmental health.
2. **Industrial Hygiene.** Industrial hygiene is the art and science of anticipating, recognizing, assessing, and controlling hazards in the workplace and community. Industrial hygienists are comprehensively trained to assess human exposures to occupational and environmental hazards.
3. **Occupational Injury Prevention.** Occupational injury prevention uses a multidisciplinary approach, including epidemiologic methods and ergonomics, to assess and prevent workplace injuries.
4. **Occupational Health Psychology** involves utilizing psychology to improve workers' work lives and protect their safety, health, and well-being.

5.2 General PhD Requirements

The PhD is intended to be completed in four years of full-time study. The University of Utah Graduate School requires PhD degrees to be completed within seven calendar years. Requests to exceed the established time limits must be recommended by the student's Supervisory Committee and the Dean of the Graduate School. The recommendation must be accompanied by a detailed timeline, and the student must have a GPA ≥ 3.0 . Students whose studies have been interrupted for extended periods of time and have been granted extended time to complete their degree may be required to complete additional courses, pass examinations, or otherwise demonstrate that they remain current in their field of study.

5.2.1 Program Competencies

In addition to the competencies specified for the student's respective emphasis, graduates from the PhD program will be able to:

1. Develop and deliver educational content related to OEHS to undergraduate or graduate students, or professionals
2. Conceive, design, and conduct original research that innovatively responds to a gap in knowledge and advances the field of OEHS
3. Convey scientific and technical information to a wide range of audiences through written works and oral presentation
4. Engage with interdisciplinary teams and the scientific community
5. Translate and disseminate research findings in occupational and environmental health to the public or non-academic organizations
6. Apply principles of ethics to occupational and environmental health

5.2.2 General Course Requirements

The PhD program requires 40 credit hours for students with a prior master's degree that included courses equivalent to this PhD program's core curriculum. Otherwise, the PhD program requires 64 credit hours. Some of the 64 required credit hours may be waived if students have taken a prior course or courses equivalent to a course or courses in the PhD program core curriculum, shown in Table 16. If a course is waived, the student must fulfill the credit requirement with a different course. Dissertation credits cannot be used to fulfill credit requirements for waived courses. Factors used to determine if a credit waiver may be granted for previous coursework include:

1. Content of the prior course
2. Student performance in the course
3. Time since course completion

A minimum of 14 credit hours of dissertation research is required. The 14 credit hours of dissertation research is counted towards the total 40 or 64 required credit hours. Students can use six dissertation credits toward elective credits, and only after completing the Qualifying Examination may students sign up for dissertation credits

Courses must be numbered 6000 or higher to be applied towards a PhD degree. Students should meet with their Supervisory Committee Chair no later than the first week of their first semester to begin developing a Program of Study that prepares them to conduct research in their area of interest and meet all requirements of the PhD program and program emphasis. The completed [Program of Study PhD Form](#) should be retained by the student and provided to the RMCOEH Graduate Academic Advisor. The core courses required for all students in the PhD program are shown in Table 18.

Table 18. Core Courses Required for all Emphases in the PhD in OEH Program

Course #	Course Title	Credits
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6370	Occupational Epidemiology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 7000	Occupational Biostatistics II	3
OEHS 6715	Occupational Health and Safety Solutions	3
OEHS 6761	Ergonomics	3
Ethics Course (Choose One)		
MDCRC 6430	Bioethical Issues in Clinical Research	1
PHIL 7570	Case Studies and Research Ethics	1
Epidemiology Course (Choose one, 3-credit course in addition to OEHS 6370)		
PBHLT 7300	Epidemiology II	3
OEHS 7720	Occupational Injury Epidemiology	3
Required Core Credits		21
Required Ethics Credit		1
Epidemiology Credit		3
Elective/Emphasis Credits		25
Dissertation Credits		14
Total Credits		64

5.2.3 Supervisory Committee

Each student in the PhD program is mentored by their Supervisory Committee. The Supervisory Committee should be formed in the student's first year of study in the PhD program and no later than the beginning of the second year. At the time of admission, each student will be assigned a faculty member to serve as their initial advisor; however, the student is not required to retain this faculty member as Chair of their Supervisory Committee or as a member of the Committee.

The Chair of the Supervisory Committee serves as the student's primary mentor. The Supervisory Committee is responsible for approving the student's academic program, preparing and evaluating the Qualifying Examination, evaluating and approving the dissertation subject and dissertation, and administering and evaluating the final oral examination (i.e., dissertation Defense).

The Supervisory Committee for PhD students consists of a minimum of five faculty members, the majority of whom must be tenure-line faculty in the OEH Division; note that the RMCOEH/OEH have received approval from UU Graduate School for the use of any of the OEH full-time faculty to fulfill this requirement (see Table 29). At least two disciplines

within RMCOEH must be represented on the Supervisory Committee for RMCOEH trainees. At least one member of the Supervisory Committee must be from another department at the University of Utah or another institution.

Supervisory Committee members who are not faculty at the University of Utah must be approved by the Dean of the Graduate School. A current CV from the proposed member must be provided to RMCOEH's Graduate Academic Advisor to provide to the Graduate School. If a member of the student's Supervisory Committee does not hold a terminal degree, a letter must be provided to describe that member's experience and qualifications.

5.2.4 Progress Monitoring

The student and the Supervisory Committee need to have shared expectations about student progress and the close monitoring of the progress. As a result, students are strongly encouraged to maintain close, regular communication with their Supervisory Committee Chair. The following are minimum requirements:

1. **Meetings each semester before the research begins:** Twice per semester with the Supervisory Committee Chair. Once per semester with the Supervisory Committee.
2. **Meetings when preparing the research proposal:** Twice per month with the Supervisory Committee Chair. Once per semester with the Supervisory Committee, preferably as a group.
3. **Meetings after research begins:** Twice per month with the Supervisory Committee Chair. Twice per semester with the Supervisory Committee, at least one of which is preferably as a group.

Faculty and students are encouraged to use the [Progress Evaluation Form](#) when they meet to discuss student progress. Specifically, twice a semester, the student and the Supervisory Committee Chair will complete a [Progress Evaluation Form](#) that documents:

1. Academic course progress in the previous semester
2. Academic course goals for the next semester
3. Timeline towards Qualifying Exam
4. Results from Qualifying Exam
5. Research progress in the prior semester
6. Research goals for the next semester
7. Challenges encountered or anticipated
8. Achievements
9. Significant deviations from the plans
10. Planned financial support for the student

The purpose of the [Progress Evaluation Form](#) is to ensure that the student and Supervisory Committee Chair share an understanding of the student's progress and activities. A copy of this form will be submitted to the Director of OEH Graduate Studies and

the RMCOEH Graduate Academic Advisor. Either the student or Supervisory Committee Chair may also provide additional confidential written comments to the OEH Director of Graduate Studies.

5.2.5 Research Proposal

All students must prepare a research proposal that describes the research that is planned for the PhD. The research proposal will be reviewed by the student's Supervisory Committee to evaluate including its scope, feasibility, and scientific merit of the work. In general, the scope of the research proposal should be consistent with three peer-reviewed publications. The research proposal must be completed before the student can sit for the Qualifying Examination and should be completed by the end of the second year in the PhD program. Students should work closely with their Supervisory Committee during the preparation of the research proposal. At the proposal review meetings, the Supervisory Committee should complete the [Proposal Approval Form](#).

Overall, the proposal should be consistent with requirements for the R-series funding mechanisms (e.g., R03) of the National Institutes of Health. The proposal should follow PHS 398 directions, and substantial deviations should be justified. The following sections should be included:

1. Specific aims (1 page) – Propose two to four specific aims and provide a short rationale for the aims.
2. Significance (1-2 pages) – Describe the significance of the problem being studied to occupational and environmental health and identify knowledge gaps addressed by the research. Students should reference funding announcements from a relevant federal agency for criteria used to help define significance.
3. Innovation (1/2 page) – Explain how the research topic and/or research methods are innovative and relative to the work of others.
4. Approach (4-8 pages) – Explain the methods that will be used to collect and analyze data to achieve the study objectives. Provide power calculations, if relevant. Describe any preliminary data to demonstrate feasibility of the research. Identify alternative methods and justify the choice being proposed. Identify the statistical tests proposed and explain how the results of the tests will answer the research questions.
5. References (unlimited length as needed) – List all cited references.
6. Timeline (0.5 pages) – Identify a timeline of research activities in order to demonstrate that the work can be completed in a reasonable period of time.
7. Budget and budget justification (1 page) – Identify and justify any expenses required to conduct the research.
8. Human subjects (1 page) – If the research involves human subjects, discuss the risk and benefits to participants, inclusion and exclusion criteria, the recruitment and consent process, methods to protect the privacy and rights of participants, and identify the status of the IRB review. If the research does not involve human subjects, but it involves people, explain why the research is exempt from review. If

- the research involves animal subjects, provide similar information (i.e., IACUC). Refer to guidelines for the NIH for definitions related to human subjects research.
9. Data management (1 page) – Explain how data will be stored. Explain quality control and assurance procedures for data entry and data analysis.

Consistent with guidelines for grant proposals from the National Institutes of Health, you must also include:

- Appropriate, informative headings and subheadings
- Informative table and figure captions
- 11-point Arial font, single spacing, and 0.5-inch margins

5.2.6 Qualifying Examination

The Qualifying Examination is intended to evaluate whether the student is prepared to conduct the proposed research and should be completed by the end of the second year of study in the PhD program. After the student's Supervisory Committee approves the research proposal, the student will work with the Supervisory Committee Chair to schedule the Qualifying Examination. The Qualifying Examination (either in whole, or in part) may be repeated once at the discretion of the Supervisory Committee. Failing the Qualifying Examination will result in dismissal from the PhD program. Students that pass the Qualifying Examination advance to candidacy.

The Qualifying Examination includes an oral component and a written component. With respect to the written component, the Supervisory Committee will prepare six to 10 questions for the student to answer in a take-home examination, which must be completed within seven calendar days. The questions typically include both broad and narrow content material, usually including: 1) learning outcomes from required core coursework, 2) PhD program emphasis-specific learning outcomes, 3) subject matter specific to the student's specific research proposal, and 4) methods related to the student's specific research proposal. Each question will be evaluated as satisfactory or unsatisfactory.

With respect to the oral component, the student will meet with their Supervisory Committee and provide an oral defense of the research proposal (generally including summary PowerPoint slides) and respond to questions about both the research proposal and the written component of the examination. The oral component will be evaluated as satisfactory or unsatisfactory.

The final outcome of the Qualifying Examination will be communicated in writing to the student, the OEH Director of Graduate Studies, and the RMCOEH Graduate Academic Advisor by the Supervisory Committee Chair within 28 calendar days of the oral presentation. It is recommended that a student only take dissertation credits after passing the Qualifying Examination.

5.2.7 Dissertation and Final Oral Examination

There are two options for doctoral dissertations: 1) a traditional dissertation and 2) three academic papers suitable for publication in a scientific journal. Students may opt for the traditional dissertation. However, most RMCOEH/OEH faculty strongly advise pursuing the three academic papers. The reasons include that the skills needed for employment align better with the academic papers option (e.g., accruing numbers of publications and impactful publications), and the general public benefits from more accessible data and scientific results.

Doctoral Candidates must prepare a written dissertation (either a traditional dissertation or the three academic papers) that is responsive to the research proposal. Any substantive deviations from the research proposal need to be approved by the Supervisory Committee in advance. For the academic papers options, students are also required to write an introductory chapter and a conclusions chapter to accompany the three papers.

The introductory chapter should describe the:

1. Importance of the problem addressed in the research to occupational or environmental health
2. The current state of knowledge and knowledge gap that motivates the research

Each of the three interior chapters responsive to the study aims should be standalone manuscripts of publishable quality. The expectation is that at least one of these chapters will be submitted to a peer-reviewed journal for publication prior to graduation.

The conclusion chapter should:

1. Link the three papers together and place the findings in the context of occupational and environmental health
2. Identify strengths and limitations of the completed research
3. Identify new or remaining knowledge gaps related to the research
4. Propose future directions for research on this topic

If a student opts to pursue the traditional dissertation, they must follow all [formatting and guidelines](#) provided by the Graduate School. The Graduate School determines the policies and procedures, including submission procedures and formatting requirements, for the traditional dissertation. These are described in [“A Handbook for Theses and Dissertations,”](#) available on the Graduate School’s website.

The formatting requirements differ for the three academic papers route. Students should work with the Graduate School and the RMCOEH Graduate Academic Advisor to ensure the dissertation is formatted and acceptable.

During the dissertation's preparation, Doctoral Candidates are expected to frequently share drafts with their Supervisory Committee, particularly the Chair, to receive helpful and timely feedback. Upon approval from the Supervisory Committee Chair, the Supervisory Committee must receive a copy of the final dissertation at least three weeks before the final dissertation Defense. Once the written work has been submitted to the Supervisory Committee, the student can no longer make edits until after the Committee has returned the dissertation with corrections and feedback.

The purpose of the final dissertation Defense is to evaluate whether the Doctoral Candidate can support and defend the methods, results, interpretation, and impact of their research among a group of peers. The final Defense is scheduled by the Supervisory Committee and is chaired by the Chair of the Supervisory Committee. The oral examination involves a public presentation of the research by the student (approximately 30 minutes), questions from the public, and private questioning by the Supervisory Committee.

Final Dissertation Defense

The final dissertation Defense is considered by the University of Utah as a public seminar. As such, the Graduate School requires the date and time of the final Defense to be widely posted at least 10 days in advance. Wide posting is defined as including, at a minimum, an email announcement to both the RMCOEH and OEH Division list-servs (faculty, staff, and students), RMCOEH social media, and the RMCOEH website. It is also recommended to be posted at entrances to RMCOEH, office areas, the entrance to RMCOEH classrooms, on the bulletin board of the Ergonomics and Safety Program in the Department of Mechanical Engineering, and on the bulletin board of the Division of OEH.

At the conclusion of the final dissertation Defense, the Supervisory Committee may require changes to the dissertation and another final Defense.

When all required changes have been made and the Supervisory Committee determines the dissertation work and requirements are all complete, the Committee then signs the [Report of the Final Examination Form](#) indicating that the dissertation has been found satisfactory for the PhD. A majority vote of the Supervisory Committee is required. Finally, the Chair of the Supervisory Committee and the Division of OEH Chair sign the final Reading Approval Form, which certifies that the final dissertation has been read and approved, and that all materials are in order for submission to the Graduate School.

The approved dissertation must be submitted to the Thesis Office in the Graduate School for format approval no later than seven weeks prior to the closing date of the semester (the last day of final examination), and no later than eight weeks prior to the closing date of the semester for dissertations in excess of 200 pages.

For other important and relevant dates please refer to the [Graduate School website](#).

5.2.8 Teaching

Training in and experiences with teaching are required for PhD students, pursuant to PhD Program Competency #1: Develop and deliver educational content related to occupational or environmental health to undergraduate or graduate students, or professionals. This specifically entails:

1. Participation in teaching training activities, such as a formal class, seminar, or workshops offered across campus. The specific training activity should be selected in consultation with the Supervisory Committee Chair and documented upon completion in the regular progress reporting.
2. Delivery of at least two hours of educational content to undergraduate or graduate students, or professionals. The teaching may be integrated into a formal class. The student is expected to develop: learning objectives, a teaching plan, and an assessment. The student is expected to use at least two pedagogical techniques, such as lecture and a small group activity. The assessment may be formal (e.g., a quiz or writing activity completed outside of class) or may be informal (e.g., journaling in class, discussion).

The delivery of educational content must be observed and evaluated by a faculty member: the Supervisory Committee Chair, instructor of the course, or the Director of OEH Graduate Studies. The faculty member will provide a letter containing constructive feedback and discuss this feedback with the student. The letter will be provided to the RMCOEH Graduate Academic Advisor for retention in the student file.

5.3 Requirements Specific to the PhD General Occupational and Environmental Health Emphasis

The PhD General Occupational and Environmental Health emphasis does not have any courses specifically required beyond the core courses for all PhD students (Table 18). Students should work with their Supervisory Committee to identify a series of courses that prepares them to conduct research in occupational and environmental health, which may include classes from various departments and schools at the University of Utah. Elective credits must be fulfilled with courses. Only six dissertation credits can be used to fulfill elective credits.

5.4 Requirements Specific to the PhD Industrial Hygiene Emphasis

Most students entering the PhD Industrial Hygiene emphasis program will have had previous graduate training in industrial hygiene or a closely related field. Beyond the PhD program core courses (see Table 18), the emphasis in industrial hygiene requires three additional courses (see Table 19). Students should work with their Supervisory Committee Chair to identify a series of elective courses that prepares them to conduct research that generates new knowledge and advances the field. Elective credits must be fulfilled with

courses. Only six dissertation credits are allowed to be substituted for elective credits. These classes may be drawn from across the University of Utah.

5.4.1 PhD Industrial Hygiene Emphasis Program Competencies

As a complement to the program competencies for the overall PhD program, graduates from the Industrial Hygiene emphasis will be able to:

1. Develop and deliver educational content related to industrial hygiene to undergraduate or graduate students, or professionals
2. Conceive, design, and conduct original research that innovatively responds to a gap in knowledge and advances the field of industrial hygiene
3. Convey scientific and technical information to diverse audiences through writing and oral presentation
4. Engage with interdisciplinary teams and the scientific community
5. Translate and disseminate research findings in industrial hygiene to the public or non-academic organizations
6. Apply principles of ethics to industrial hygiene

Table 19. Required Courses for the PhD in OEH Industrial Hygiene Emphasis

Requirement		Credits
OEHS 6751	Advanced IH	3
OEHS 6752	Intro to Industrial & Environmental Toxicology & Physiology	3
OEHS 6753	Industrial Ventilation	3
Required PhD Core Credits		21
Required PhD Ethics Course Credits		1
Required Epidemiology Course Credits		3
Total IH Emphasis Credits		9
Total Elective Credits		16
Dissertation Credits		14
Total Required Credits		64

5.5 Requirements Specific to the PhD Occupational Injury Prevention Emphasis

Students in the Occupational Injury Prevention (OIP) PhD program come from various backgrounds and previous training, including epidemiology, public health, mechanical engineering, nursing, medicine, health, kinesiology, psychology, and environmental health. In addition to the PhD program core courses (see Table 18), the emphasis in OIP requires six additional courses (see Table 20). Students should work with their Supervisory Committee to identify a series of elective courses that prepares them to conduct research in OIP, which may include classes from diverse departments and schools at the University of

Utah. Elective credits must be fulfilled with courses. Only six dissertation credits can be used to fulfill elective credits.

Table 20. Required Courses for the PhD in OEH Occupational Injury Prevention Emphasis

Course #	Course Title	Credits
OEHS 7720	Occupational Injury Epidemiology	3
OEHS 6810	Occupational Health Psychology	3
OEHS 6703	Clinical & Behavioral Aspects of Occ. Injuries & Disease	3
MDCRC 6210	Regression Models	2
PHS 7050	Statistical Practice	3
STAT 6003	Survey of Statistical Computer Packages	3
Required PhD Core Credits		21
Required PhD Ethics Credit		1
Required Epidemiology Credit		3
Required Emphasis Core		17
Research Emphasis Electives		8
Dissertation		14
Total Credits		64

5.5.1 Occupational Injury Epidemiology Competencies for the PhD program

- Apply principles and research methods in occupational and environmental health and occupational injury prevention
- Develop and deliver quality OIP-specific educational content to undergraduate or graduate students, or professionals
- Conceive, design, and conduct original research that responds to a gap in knowledge and advances knowledge in the field of occupational and environmental health
- Convey scientific and technical information to diverse audiences through writing
- Demonstrate effective oral communication
- Engage with interdisciplinary teams and the scientific community
- Translate and disseminate research findings in occupational and environmental health to the public or non-academic organizations
- Apply principles of ethics to occupational and environmental health

5.6 Requirements Specific to the PhD Occupational Health Psychology Emphasis

Occupational health psychology (OHP) is an emerging and growing discipline within occupational safety and health and one that offers opportunities to dramatically improve the lives of workers and aid businesses amid the ongoing mental health crises in workplaces. Students in the OHP PhD program come from diverse backgrounds and

previous training, including epidemiology, public health, and psychology. In addition to the PhD program core courses (see Table 18), the emphasis in OHP requires four additional courses (see Table 21). Students should work with their Supervisory Committee to identify a series of elective courses that prepares them to conduct research in OHP, which may include classes from various departments and schools at the University of Utah. Elective credits must be fulfilled with courses. Only six dissertation credits can be used to fulfill elective credits.

Table 21. Required Courses for the PhD in OEH Occupational Health Psychology Emphasis

Course #	Course Title	Credits
OEHS 6840	Methods in Occupational Health Psychology	3
OEHS 6810	Occupational Health Psychology	3
OEHS 7810	Advanced Seminar in Occupational Health Psychology	3
Statistics and Methods Course (3 credits required from list below)		
PBHLT 6106	Categorical Data Analysis	3
PSY 6550	SEM	3
PSY 6558	MLM	3
MDCRC 6210	Regression Models	2
MDCRC 6220	Survey Methods	2
PBHLT 6320	Qualitative Mixed Methods in Public Health	3
PBHLT 7130	Longitudinal Data Analysis	3
Required PhD Core Credits		21
Required PhD Ethics Credit		1
Required Epidemiology Credit		3
Required Emphasis Core		12
Research Emphasis Electives		13
Dissertation		14
Total Credits		64

5.6.1 Occupational Health Psychology Competencies for the PhD program

1. Apply principles and research methods in OEHS and occupational health psychology.
2. Conceive, design, and/or conduct original research that advances knowledge or practice in OHP.
3. Convey scientific and technical information to diverse audiences through effective writing or oral communication.
4. Engage with interdisciplinary teams and the scientific community.
5. Disseminate OHP-specific research findings or educational content to students, professionals, the public, or non-academic organizations.
6. Apply principles of ethics to occupational and environmental health.

5.7 Additional Funding-Based Requirements

All PhD students may participate in the various activities. However, some funding mechanisms require that those receiving funding participate in those activities as a condition of the financial support (see Table 22).

Table 22. Activities Required by Specific Funding Mechanisms, including RMCOEH (examples)

Activity	Required for PhD students who are:
Present at Traditional Journal Club once per year and at Flash Journal Club once per year	Required by the RMCOEH NIOSH Education and Research Center grant for its funding recipients
Provide an educational component in the Targeted Research Training Seminar twice	Required by the Targeted Research Training program within the RMCOEH NIOSH Education and Research Center grant for its funding recipients
Be either a Research Assistant or Study Coordinator for a research study or project	Required by either the Occupational Injury Prevention Research Training program or Targeted Research Training program in the RMCOEH NIOSH Education and Research Center grant for their funding recipients
Be a Teaching Assistant for a minimum of one course or more depending on division needs	Required by either the OIP program, OHP program, and TRT program in the RMCOEH NIOSH Education and Research Center grant for their funding recipients and/or RMCOEH supported students

5.8 Summary of Important Dates, Guidelines, and Milestones

A four-year timeline of student activities, with key milestones and guidelines, is shown in Table 23. By the second year of study, PhD students should have formed a Supervisory Committee and be meeting with it at least once per semester. The student and Supervisory Committee Chair must document student progress once per semester.

Table 23. Guidelines and Milestones for Completion of the PhD in OEH

Year 1
<ul style="list-style-type: none"> • Form a Supervisory Committee, and submit relevant paperwork to the RMCOEH Graduate Academic Advisor • Develop a Program of Study for approval by the Supervisory Committee by end of first year • Begin developing research proposal ideas
Year 2
<ul style="list-style-type: none"> • Prepare research proposal • Complete Qualifying Examination • Start dissertation research • Meet with Supervisory Committee and submit Progress Evaluation Form each semester • Consider the following: Write a grant to support your dissertation research, such as the Pilot Project Training Program grants from RMCOEH; attend a Dissertation Boot Camp hosted during fall and spring breaks by the Graduate School and/or Dissertation Boot Camp hosted by RMCOEH Senior Technical Writer; submit an abstract to a conference
Year 3
<ul style="list-style-type: none"> • Continue dissertation research • Prepare and submit a paper for publication • Submit an abstract to a conference • Meet with Supervisory Committee and submit Progress Evaluation Form each semester • Consider the following: write a grant to support your dissertation research, such as the Pilot Project Training Program grants from RMCOEH; attend a Dissertation Boot Camp hosted during fall and spring breaks by the Graduate School and/or Dissertation Boot Camp hosted by RMCOEH Senior Technical Writer; submit an abstract to a conference
Year 4
<ul style="list-style-type: none"> • Candidate's Program of Study with approval by the Supervisory Committee must be submitted to the Graduate School no later than one semester prior to graduation. • Apply for graduation through the student's UU CIS account for Spring graduation • Complete dissertation • Complete final dissertation Defense • Submit papers for publication • Meet with Supervisory Committee and submit Progress Evaluation Form each semester • File dissertation with the Graduate School

6 Graduate Certificate of Occupational Safety and Health

6.1 Program Coursework

The purpose of the Graduate Certificate of Occupational Safety and Health (COSH) is to help meet graduate-level regional and national needs for personnel trained in areas related to Occupational Safety and Health. The COSH will require students to complete at least 15 credit hours of graduate-level coursework (see Tables 24-27). Students elect to participate in one of the following options:

- COSH with emphasis in Ergonomics and Safety (E&S)
- COSH with emphasis in Industrial Hygiene (IH)
- COSH without emphasis (General OSH)
- COSH with emphasis in Occupational Health (OH)

Students in the Graduate Certificate of Occupational Safety and Health Program will typically have completed a baccalaureate degree in chemistry or biology or physics. Many of these students already have jobs with occupational health and safety responsibilities and will be seeking improved knowledge and skills to better perform or advance their careers.

Some COSH students will wish to continue beyond the COSH to master's or doctoral studies in occupational health and safety. The COSH will be of interest and value to professionals outside of those working in industrial hygiene, safety, ergonomics, occupational health, or related fields. This certificate will benefit physicians and nurses working in occupational health.

Table 24. COSH Industrial Hygiene Emphasis

Course #	Course Title	Credits
OEHS 6370	Occupational Epidemiology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
Sub-Total		9
Elective Courses: Select at least two of the following courses		
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6752	Introduction to Industrial Toxicology and Physiology	3
OEHS 6751	Advanced Industrial Hygiene	3
OEHS 6753	Industrial Ventilation	3
OEHS 6754	Noise and Other Physical Agents	3
OEHS 6756	Hazardous Substances	3
OEHS 6730	Quantitative Exposure Assessment	3
OEHS 6810	Occupational Health Psychology	3
Total Credits		15

Table 25. COSH Occupational Health Emphasis

Course #	Course Title	Credits
OEHS 6370	Occupational Epidemiology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
Sub-Total		9
Elective Courses: Select at least two of the following courses		
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6752	Introduction to Industrial Toxicology and Physiology	3
OEHS 6703	Clinical and Behavioral Aspects of Occupational Injuries and Diseases	3
OEHS 6810	Occupational Health Psychology	3
Total Credits		15

Table 26. COSH Ergonomics and Safety Emphasis

Course #	Course Title	Credits
OEHS 6370	Occupational Epidemiology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
OEHS 6761	Ergonomics	3
MEEN 6110	Introduction to Industrial Safety	3
Total Credits		15

Table 27. COSH Without Emphasis

Course #	Course Title	Credits
OEHS 6370	Occupational Epidemiology	3
OEHS 6750	Fundamentals of Industrial Hygiene	3
OEHS 6760	Administration and Management of Health and Safety Programs	3
Sub-Total		9
Elective Courses: Select at least two of the following courses		
OEHS 6000	Applied Occupational Biostatistics	3
OEHS 6752	Introduction to Industrial Toxicology and Physiology	3
OEHS 6703	Clinical and Behavioral Aspects of Occupational Injuries and Diseases	3
OEHS 6751	Advanced Industrial Hygiene	3
OEHS 6753	Industrial Ventilation	3
OEHS 6754	Noise and Other Physical Agents	3
OEHS 6756	Hazardous Substances	3
OEHS 6730	Quantitative Exposure Assessment	3
OEHS 6761	Ergonomics	3
MEEN 6110	Introduction to Industrial Safety	3
MEEN 6120	Human Factors Engineering	3
OEHS 6810	Occupational Health Psychology	3
Total Credits		15

6.2 Important Deadlines

For graduation deadlines please visit: <https://registrar.utah.edu/graduation/>

7 Targeted Research Training Program

The goal of RMCOEH's Targeted Research Training (TRT) program is to graduate groundbreaking, independent researchers in one of three occupational safety and health areas who have received advanced research training. This is accomplished through a curriculum that includes supplementary training activities. Students in the Occupational and Environmental Health PhD program (any emphasis) and in the Mechanical Engineering PhD program (Ergonomics & Safety emphasis) may receive financial support through RMCOEH's TRT program. Any other PhD student is also welcome to participate in TRT program activities. (The TRT program also supports post-doctoral training.)

The TRT program requirements are:

1. Research Education (REd)s Classes:

- a. Getting Published: Responsible Authorship & Peer Review
- b. Onboarding for New PI's: Submitting Proposals at the U of U
- c. Budget Preparation and Development
- d. Grants Management Essentials

2. Required Core Courses (9 credits total):

- OEHS 6370 Occupational Epidemiology (3 credits)
- OEHS 6715/MEEN 6140 Occupational Safety & Health Solutions (3 credits)

One of more of the following courses:

- OEHS 6750 Fundamentals of Industrial Hygiene (3 credits)
- OEHS 6761/MEEN 6100 Ergonomics (3 credits)
- MEEN 6110 Introduction to Industrial Safety (3 credits)
- OEHS 6810 Occupational Health Psychology (3 credits)

3. Research Ethics Course (1credit)

4. OEHS Targeted Research Training Seminar X 2 (1 credit each)

5. Dissertation (interdisciplinary, and must include 1+ OEHS committee member(s) (14 credits)

Upon completion of the RED courses, students must send a copy of the certificate of completion to the RMCOEH Graduate Academic Advisor and the TRT Program Director.

8 Details about Extra-Curricular Training Requirements

8.1 Research Administration Training Series Core Courses

The Research Education Classes (REd)s Courses are offered by the Office of the Vice President. There are dozens of courses available about different aspects of research

management. Courses may be online and/or in person. All courses require online registration. Online classes are offered through the online learning management system, Canvas/Instructure. For more information about REds courses and to sign up for courses, please see the following website: https://education.research.utah.edu/red_classes/.

To document completion of any REds course, students must send a copy of the certificate of completion to the RMCOEH Graduate Academic Advisor.

IRB CITI Training for the protection of human subjects is required for all RMCOEH students, faculty, and staff. The OEH Division and RMCOEH have extensive research studies, patient care, and other information that require careful attention to the protection of human subjects. HIPAA training is similarly required.

9 University Policies

9.1 Leave of Absence/Family Medical Leave & Parental Leave Policies

Students are required by the Graduate School to be enrolled in at least one class during fall and spring semesters. Students who wish to discontinue studies for one or more semesters (other than summer semester) may request a leave of absence to postpone their studies for up to one year. The leave of absence must be approved by the student's Supervisory Committee Chair, the Director of OEH Graduate Studies or the Division of OEH Chair, as well as the Dean of the Graduate School. Students must complete a Graduate Leave of Absence Form, which is available through the Office of the Registrar.

Requests may be granted on a yearly basis for the following circumstances:

1. Illness, military service, pregnancy, childcare, residence outside the state of Utah, and work in progress in which students are not in continual contact with the their Supervisory Committee or other members of the faculty.
2. When students, in the judgment of their Supervisory Committee Chair, are engaged in work considered beneficial to the student's academic goals, such as temporary teaching or professional employment, that allows the student ultimately to complete the degree.
3. For other reasons that the student's Supervisory Committee Chair believes to be in the best interest of both the student and the university.

Students must apply for leaves of absence for a current semester by the last day of classes of that semester. They also must officially drop or withdraw from classes prior to a leave of absence being granted. For more information about official withdrawal, see Graduate School Grading Policies at: <https://gradschool.utah.edu/graduate-catalog/grading-and-credit-policies/>. The period during which a leave of absence is granted does not count toward the period allowed to complete the degree. Leaves are granted for a maximum of one academic year at a time.

RMCOEH/OEH provides up to 12 weeks of parental leave to graduate students who are in good standing in the MOH, MSOH, and PhD programs and have not yet defended their thesis or dissertation. Ordinarily this 12-week period begins with the birth date of the child, but adjustment may be made to accommodate issues that arise prior to the birth. In some circumstances, men who are the primary caregiver within the family may qualify and may petition the Division of OEH Chair for such consideration. Students who qualify for this leave will be paid at the student's normal rate. Should additional medical complications arise that require longer-term medical care, students should seek a leave under the policy for graduate student leaves. For further information please refer to the university website: <https://gradschool.utah.edu/navigating-grad-school/graduate-policies/parental-leave-policy-for-graduate-students.php>.

9.2 Minimum Grades

Candidates for graduate degrees at the University of Utah are required to maintain a 3.0 or higher GPA in coursework counted toward the degree. In addition, a grade below B- is not accepted for credit for a required class needed for any of the OEH graduate degrees (MSOH/MOH/PhD) and indicates a student has not demonstrated competence in a discipline necessary for success within that OEH program. Please refer to the Graduate School Grading and Credit Policies at: <https://gradschool.utah.edu/graduate-catalog/grading-and-credit-policies/>.

The following actions will be taken when a student receives lower than a B-:

1. Student is placed on probation. The student will be notified in writing that they are on departmental probation.
2. Student will be allowed to retake the class one time and must earn a B- or higher grade, or they will be automatically dismissed from the program.
3. A student who receives a grade of below B- in a core course will be permitted to take other program courses for which this core course is not a prerequisite. Students will not be permitted to accrue more than 15 additional credit hours before retaking the core course.
4. A student who earns a grade below B- in two core courses will not be permitted to enroll in any further courses until they have retaken both courses and received grades of B- or better.
5. If a student receives an unacceptable grade in three or more core courses, they will be automatically dismissed from the program.
6. Two grades lower than a B- in elective courses will also be a consideration for dismissal.

Actions arising from the minimum grades policy may be appealed using the appeals process outlined by the University of Utah in the Code of Student Rights and Responsibilities (Policy 6- 400).

9.3 Credit/No-Credit Policy

The intent of the credit/no-credit (CR/NC) option is to free students to extend their studies to areas outside their major or specialty and to take classes they otherwise may not if they had to compete with majors for a letter grade. Some sources of financial support are unable to be used to pay for tuition to cover CR/NC courses (including RMCOEH's NIOSH ERC training grant), so students must check with the RMCOEH Graduate Academic Advisor and the Program Director to verify that CR/NC courses are eligible for tuition benefit. For more information regarding whether CR/NC courses will apply towards your degree, check with the Graduate Academic Advisor.

9.4 Petition for Graduate Credit

OEH graduate students may be allowed to receive credit (\leq six credit hours or two courses) towards their graduate degree for select graduate-level courses (5000 level and above) that they took (and passed with a B grade or better) while enrolled as an undergraduate student. Courses must have been taken no more than three years prior to the petition. Credit used to earn the undergraduate degree may not be counted toward a graduate degree. The request is submitted using the Undergraduate Petition for Graduate Credit form, available from the Office of the Registrar. The head of the undergraduate program must verify that the courses were not required as part of the undergraduate major or minor. Contact the RMCOEH Graduate Academic Advisor to start this petition process.

9.5 Transfer of Credit

Graduate credit may be transferred from other institutions and used for only one University of Utah degree. Up to six semester hours of transfer credit may be applied toward graduate degree requirements. Courses will be reviewed on a course-by-course basis, using the course syllabus and course materials, to determine sufficient coverage and/or overlap with courses required by the student's OEH graduate program. The transfer of credit and substitution for a required course must be approved by following the process outlined in Section 9.6 Waivers (below).

To explore transfer credits, please contact the RMCOEH Graduate Academic Advisor.

9.6 Waivers

The process for requesting a waiver is as follows:

- Student requests a waiver by sending an email request to the RMCOEH Graduate Academic Advisor.
- The advisor requests documentation (e.g. syllabus and key assignments) from the student.
- The student provides documentation, and the advisor sends the documentation to the course instructor for review. The documentation is also sent to the program director.
- The course instructor reviews the documentation, compares it to the learning objectives of the student's course, then makes a recommendation to the Program Director, if applicable, and the Director of OEH Graduate Studies.
- The Program Director must approve the waiver.
- The Director of OEH Graduate Studies then makes the final decision on the waiver, and the advisor informs the student of the outcome.

It is strongly recommended that students work with the Supervisory Committee Chair to find appropriate courses to replace the courses that are waived. Any course that has been waived must be replaced with course credit. Dissertation credits cannot be used to fulfill credit hours from waived courses.

9.7 Limits on Credit Hours

A schedule of nine credit hours per semester is considered full-time for graduate students. No student in a graduate program is permitted to register for more than 16 credit hours in any single semester. For students interested in registering for more than 16 credit hours, please contact the RMCOEH Graduate Academic Advisor. A minimum of 9 credit hours and a maximum of 12 credit hours can be taken per semester for students being funded from RMCOEH or the OEH Division. If a RMCOEH- or OEH Division-funded student wishes to take more than 12 credit hours per semester, they must consult with the Graduate Academic Advisor.

Occupational and Environmental Medicine residents are approved to register for 16 credits per semester.

9.8 Non-matriculated Credit

Credit earned by non-matriculated students may apply to a graduate degree program, but it must be approved by the Director of the OEH Graduate Studies. Non-matriculated credit that can be applied toward a graduate degree is limited to nine semester hours with a grade of B or higher. Students must disclose to the RMCOEH Graduate Academic Advisor prior to their first semester of graduate studies if they intend for non-matriculated coursework to be potentially used towards the graduate degree. Failure to disclose non-matriculated coursework prior to the beginning of the matriculated semester will result in a decision that the credit(s) will not apply to the RMCOEH/OEH graduate program.

9.9 Artificial Intelligence

Students are expected to adhere to generally accepted academic honesty standards, including refraining from cheating, plagiarizing, misrepresenting one's work, and/or inappropriately collaborating. This includes the use of generative AI (Artificial Intelligence) tools that has not been cited or use documented or authorized. Students will also be expected to adhere to the prescribed professional and ethical standards of the profession/discipline for which the student is preparing. Any student who engages in academic dishonesty or who violates the professional and ethical standards for the profession/discipline for which the student is preparing, may be subject to academic sanctions as per the University of Utah's Student Code:

<https://regulations.utah.edu/academics/6-400.php>

10 Financial Information

*F*ull-time traditional (i.e., on-campus) graduate students may be eligible to receive partial or full tuition and stipend support. Sources of funding commonly include the RMCOEH grant and research grants.

These funds are available for many students through RMCOEH's National Institute for Occupational Safety and Health (NIOSH) Education and Research Center grant. Such funds are awarded by NIOSH based on the recommendation of the RMCOEH Center Director. To be eligible for these funds, a student must be a U.S. citizen or a green card holder.

Other funds and scholarships may be available. See below.

10.1 Tuition Waivers

<https://financialaid.utah.edu/tuition-and-fees/tuition-waivers.php>

Tuition waivers normally are awarded for two semesters per academic year. Students may utilize scholarships during summer terms if they enroll full time (nine hours); however, no student may receive a tuition waiver for more than eight semesters. Incompletes, repeated hours, withdrawals, correspondence courses, and audited hours do not count towards renewal of scholarships.

Students may receive only one University of Utah full tuition waiver scholarship. If a student is awarded more than one such scholarship, it will be necessary to indicate a preference for one and to decline all others. In addition, students on tuition waiver scholarships are required to take a minimum of nine credit hours per semester.

10.2 Financial Support Policies

https://regulations.utah.edu/academics/revisions_6/6-420.pdf

POLICY 6-420 Scholarship, Grant, Fellowship and Tuition Waiver Policy: The purpose of this policy is to enhance the overall coordination of Scholarship, Grant, Fellowship and Tuition Waiver and related forms of financial aid for students, as between individual academic colleges and departments, service departments, and all personnel involved in the student financial aid awarding process. Public confidence in university stewardship of these resources is achieved when the highest ethical standards of impartiality and fairness are maintained through all stages of processing awards and when internal controls operate effectively.

10.3 Scholarships

There are multiple scholarship opportunities for students at the University of Utah. There are scholarship options both nationally and through RMCOEH. Students are encouraged to apply for national scholarships related to Occupational and Environmental Health, including:

- BCSP Foundation Scholarship: Deadline to apply is early October; one \$5000 scholarship is available to a student in the MSOH Industrial Hygiene emphasis program
- American Industrial Hygiene Foundation (AIHF): Deadline to apply is late January. There are a series of national scholarships and local scholarships (Jeff Lee Scholarship; D. Jeff Burton Scholarship) awarded through this application
- 3M Scholarship: Deadline to apply is early March. Multiple \$5000 scholarships are awarded to applicants nationally.
- AIHA Local Utah Section Scholarship: Deadline to apply is late Fall. Multiple scholarships are awarded annually to students in the Industrial Hygiene emphasis

Scholarship opportunities limited to RMCOEH trainees are listed below. All applications for these scholarships must be submitted to a RMCOEH administrative assistant and the RMCOEH Graduate Academic Advisor by **March 1**. The RMCOEH Center Director, on the recommendation of a scholarship committee, determines which student(s) receive scholarships and the amount awarded. Other than for the Dr. Paul Richards scholarships, award amounts are linked to endowment growth; thus, if a student graduates and chooses to help by contributing to these scholarships in future years, the graduate will help future generations of students!

RMCOEH faculty and staff continue to contribute to these endowed scholarship funds for the benefits of current and future RMCOEH students.

The **DR. RICHARD E. JOHNS ENDOWED SCHOLARSHIP** was established by the family of Dr. Johns in his memory and to honor his legacy of education and scholarship. Dr. Johns was the Occupational and Environmental Medicine Director for RMCOEH from 1987-1989 and subsequently Medical Director for ATK Thiokol for many years. RMCOEH will award individual scholarship(s) with a value of up to \$2,000 for use for tuition, fees, and full-time academic expenses while pursuing graduate studies. To be eligible, an entering student must: meet all admissions requirements to the RMCOEH program for which the student is a candidate OR be a current student:

- Have an overall undergraduate GPA of 3.0 (on a 4.0 scale) or better
- Write a personal statement (1-page maximum, 12 pt. Arial or Times New Roman font)
- Demonstrate the potential to excel in graduate-level programs by work/life experiences, etc.
- Complete a Scholarship Application form

Selection criteria include: 1) past academic performance; 2) professional, work, or personal experience; 3) financial need; and/or 4) potential to complete the program and contribute to worker health and safety.

The **R. JESSICA HANFORD, MD, MPH SCHOLARSHIP** was established by Dr. Hanford and is also known as the Rocky Mountain Center for Occupational and Environmental Health Random Poetry Prize. Dr. Hanford was a RMCOEH Occupational and Environmental Medicine resident and practiced OEM in Washington state. Applications for this scholarship consist solely of the submission of an original poem on the subject of occupational health and safety. One scholarship recipient in good standing will be chosen by random drawing, with the only additional requirement being that the winner be awarded the prize upon acceptance of the poem for publication. Dr. Hanford generously provided this award to encourage creativity and to “playfully protest all the required non-winning scholarship essays I didn’t have time for.” Her requirements include that the “length of the poem should not exceed 65 words by more than five words. Spelling and punctuation count. It should be of publishable quality.”

The **ROYCE MOSER, JR. AND LOIS H. MOSER ENDOWED SCHOLARSHIP IN OCCUPATIONAL HEALTH** was established by Dr. and Mrs. Moser and is awarded to an outstanding student who has been accepted into one of RMCOEH’s Graduate Degree Programs at the University of Utah. After completing service in the U.S. Air Force, including serving as the Commander of the School of Aerospace Medicine, Dr. Moser was the RMCOEH Center Director from 1986-2003. For purposes of this scholarship, occupational health fields include: Industrial Hygiene, Mining Safety, Occupational Health Nursing, Occupational Health Psychology, Occupational Injury Prevention, Occupational and Environmental Medicine, Ergonomics and Safety, and Aerospace Medicine. If not yet enrolled in one of RMCOEH’s degree programs at the University of Utah, the student must demonstrate substantial interest in occupational health. The scholarship will be additionally awarded based on outstanding academic achievement, and financial need.

The **DALLAS BRADFORD ENDOWED SCHOLARSHIP IN OCCUPATIONAL HEALTH** was established by Dr. Kurt and Kristine Hegmann and WCF insurance. It is awarded to an outstanding student who has been accepted into one of RMCOEH’s Occupational and Environmental Health and Safety Graduate Degree Programs at the University of Utah. Mr. Bradford is current Chair of the Board of Directors of WCF Insurance. For purposes of this scholarship, occupational health fields include: Industrial Hygiene, Mining Safety, Occupational Health Nursing, Occupational Health Psychology, Occupational Injury Prevention, Occupational and Environmental Medicine, Ergonomics and Safety. The scholarship will be awarded based on outstanding academic achievement and/or financial need.

The **D. JEFF BURTON ENDOWED SCHOLARSHIP IN OCCUPATIONAL HEALTH** was established by Jeff Burton. He served as President of AIHA and is an international expert in ventilation. The scholarship is awarded to an outstanding engineering student in either engineering or an occupational health field (Safety, Ergonomics, Industrial Hygiene, and Occupational Injury Prevention). The scholarship is awarded based on engineering

background; interest in studying and/or designing and engineering ventilation systems to prevent diseases; outstanding academic achievement; and/or financial need.

The **DR. PAUL S. RICHARDS WCF INSURANCE SAFE WORKPLACE SCHOLARSHIP** was established by WCF Insurance in an effort to serve the 19,000 Utah employers and the student’s employees. Dr. Richards is considered the father of OEHS in Utah, and his services included being medical director for the Kennecott copper mine. The scholarship is intended for graduate students studying Ergonomics and Safety, Industrial Hygiene, Occupational Injury Prevention, and Occupational and Environmental Medicine at RMCOEH. **The program is administered by WCF Insurance.** WCF Insurance funds and awards individual scholarships valued up to \$5,000 for use towards for tuition, fees, and full-time academic expenses while studying at RMCOEH. Completed application forms, transcripts and letters of recommendation must be received at WCF Insurance, 100 West Towne Ridge Parkway, Sandy, Utah 84070, by **March (TBD)**. The applicant is solely responsible to assure all materials are received at WCF Insurance’s office by the deadline. If you have questions, please contact a RMCOEH administrative assistant or the Graduate Academic Advisor.

Selection criteria include:

- Past academic performance
- Professional, work, or personal experience
- Financial need
- Potential to complete the program and contribute to worker health and safety.

Selections are made by a panel chosen by WCF Insurance.

Table 28. Additional Helpful Resources

Getting to RMCOEH	
The RMCOEH headquarters is located in the 250 Tower at 250 E. 200 S. in downtown Salt Lake City and is easily accessible by car or public transit.	
Getting to 303 Chipeta Way in Research Park on the University of Utah main campus: TRAX: Take the Red Line Train to University South Campus Station, then ride the Purple University of Utah shuttle bus to the intersection of Wakara Way and Chipeta Way.	
UTA bus: Routes 228, 313, 455 and 473 drop off in Research Park. For the most up to date bus schedules visit: rideutah.com	
UTA Transit Pass	https://commuterservices.utah.edu/
Parking Services	For Non-Campus Parking https://commuterservices.utah.edu/

	<p>Parking at 303 Chipeta Way is open, and requires an REA permit. (contact academic advisors for assistants)</p> <p>For 250 Tower parking, contact a RMCOEH administrative assistant (801-581-4800)</p>
New to the U Resources	
UCARD Services (University ID)	https://ucard.utah.edu/
New Student Guide from University Information Technology (UIT)	<p>Includes: Free/discounted software, connecting to the university's wireless network, security policies, and other helpful IT resources.</p> <p>https://it.utah.edu/help/it_guides/new_student_guide.php</p>
Campus Safety	
Campus Alert System	https://alert.utah.edu/
Department of Public Safety	https://publicsafety.utah.edu/
Health Care	
Student Health	https://studenthealth.utah.edu/
University Counseling Center	https://counselingcenter.utah.edu/
Subsidized Health Insurance	https://gradschool.utah.edu/funding/tbp/gship/index.php
Financial Resources	
Subsidized Health Insurance	https://gradschool.utah.edu/funding/tbp/gship/index.php
Residency for Tuition Purposes	https://admissions.utah.edu/information-resources/residency/
Tuition Benefit Program Requirements	https://gradschool.utah.edu/funding/tbp/index.php/tuition-benefit-%20program-%20guidelines/
Personal Money Management Center	https://financialwellness.utah.edu/
Resources Specific to Graduate Students	
The Graduate School	https://gradschool.utah.edu/
Marriot Library Graduate Resources	https://lib.utah.edu/services/education/gradstudents
Writing Center	https://writingcenter.utah.edu/
Additional Resources	
Student Success Tips from the Dean	https://deanofstudents.utah.edu/support/success.php
Office of Equal Opportunity, Affirmative Action and Title IX	https://oeo.utah.edu/
Women's Resource Center	https://womenscenter.utah.edu/
Center for Student Access and Resources	https://studentresources.utah.edu/
Veterans Support Center	https://veterans.utah.edu/
International Student Services	https://iss.utah.edu/
Childcare Resources	https://childcare.utah.edu/
Center for Disability Access (CDA)	https://disability.utah.edu/portal.php

A: Standards of Behavior

A.1 Graduate Student Conduct and Dismissal Policy Student Performance Expectations

The OEH Graduate Programs maintain the highest academic standards and abide by the general Standards of Behavior (Section III) and expectations of Professional and Ethical Conduct (Section VI) outlined in the University's Student Code of Rights and Responsibilities (University Policy #6-400). All graduate programs sponsored by RMCOEH/OEH within the division of OEH also take measures to ensure that the Standards of Academic Performance (Section IV) and Academic Conduct (Section V) are met.

A.2 Unacceptable Academic Performance

Unacceptable or incomplete academic performance includes, but is not limited to:

1. Failure to pass all courses (including core, elective, and remedial) with a grade of B- or better
2. A cumulative GPA of less than 3.0

Unacceptable academic performance could lead to a maximal sanction of dismissal from the academic program.

A.3 Academic Misconduct

In a research environment, there is an absolute need for trust between a student and the student's mentor. Consequently, RMCOEH and the Division of OEH take cases of academic misconduct very seriously. Cases of academic misconduct include, but are not limited to:

1. Plagiarism
2. Cheating
3. Misrepresenting one's work
4. Fabrication or falsification of information
5. Disobeying any rule as specified by the program rules for exams and homework assignments (see below)
6. Intentionally helping, or attempting to help, another person commit an act of misconduct

Students committing misconduct can expect up to three levels of sanction: sanctions imposed by the instructor(s), sanctions imposed by the Division of OEH or the Department of Mechanical Engineering and sanctions imposed by the university. An instructor may impose a maximum sanction of failing the student in the course. The OEH Division may expel the student from the student's chosen graduate program of study, and the university may expel the student from the university entirely, or even revoke a previously awarded degree. For each level of sanction, the student has the right to appeal. All cases of

misconduct will be documented and placed in the student's file. Adapted from the University of Utah Policy #6-400 and the University of Utah Bioscience PhD program.

The OEH faculty reserve the right to use electronic software to scan reports, essays, papers, theses/dissertations, proposals, and any other written material for evidence of plagiarism.

A.4 Program Rules for Coursework

The following rules apply to all examinations and written assignments for courses in the OEH graduate programs unless course instructor provides specific direction otherwise:

1. A student must work entirely alone or in assigned groups/teams
2. A student may not share information about any aspect of the exam with any student who has not already taken the exam this year, or its equivalent in future years
3. A student must direct all questions concerning the exam or homework assignment to the course instructor
4. It is the student's responsibility to obtain clarification from the course instructor if there are questions concerning how these requirements apply within a particular course
5. A student shall not plagiarize. Plagiarism includes, but is not limited to:
 1. Presenting another's writing, ideas, research, etc., as one's own original work
 2. Using a figure, table, or data from another's work and failing to acknowledge the source
 3. Lengthy paraphrasing without appropriate acknowledgement, including one's own previous work if published
 4. Use of images, tables, data, text, etc., from open sources without crediting the source and citing in accordance with the publisher's wishes

Please refer to the following definitions, as those students funded by training and research grants must also abide by federal standards.

Definitions

Most OEH graduate students are either: 1) funded by training and research grants and must abide by federal standards, and/or 2) will conduct and report research over a career. Thus, it is important to know the definition of scientific misconduct as defined by the U.S. government.

The National Academy of Sciences definition of misconduct in science is: Misconduct in science is defined as fabrication, falsification, or plagiarism, in proposing, performing or reporting research. Misconduct in science does not include: honest errors in the recording, selection, or analysis of data; differences in opinions involving the interpretation of data; or misconduct unrelated to the research. All students should be familiar with the rights and responsibilities articulated in the Code of Student Rights and Responsibilities, University Policy #6-400.

The following definitions, found in Section I.B., are particularly important to academic conduct within RMCOEH's programs and are taken from the University of Utah's Code of Student Rights and Responsibilities, University Policy #6-400.

1. Academic misconduct includes, but is not limited to, cheating, misrepresenting one's work, inappropriately collaborating, plagiarism, and fabrication or falsification of information, as defined further below. It also includes facilitating academic misconduct by intentionally helping or attempting to help another to commit an act of academic misconduct.
2. Cheating involves the unauthorized possession or use of information, materials, notes, study aids, or other devices in any academic exercise, or the unauthorized communication with another person during such an exercise. Common examples of cheating include, but are not limited to, copying from another student's examination, submitting work for an in-class exam that has been prepared in advance, violating rules governing the administration of exams, having another person take an exam on one's behalf, or violating any rules relating to academic conduct of a course or program.
3. Misrepresenting one's work includes, but is not limited to, representing material prepared by another as one's own work.
4. Plagiarism means the intentional unacknowledged use or incorporation of any other person's work in, or as a basis for, one's own work offered for academic consideration or credit or for public presentation. Plagiarism includes, but is not limited to, representing as one's own, without attribution, any other individual's words, phrasing, ideas, sequence of ideas, information, tables, figures, images, data, or any other mode or content of expression.
5. Fabrication or falsification includes reporting experiments or measurements or statistical analyses never performed, manipulating or altering data or other manifestations of research to achieve a desired result, falsifying or misrepresenting background information,
6. Academic sanction means a sanction imposed on a student for engaging in academic or professional misconduct. Examples of academic sanctions include, but are not limited to:
 - Requiring a student to retake an exam(s) or rewrite a paper(s)
 - Issuance of a grade reduction or even a failing grade
 - Probation, suspension, or dismissal from a program
 - Probation, suspension, or dismissal from the university
 - Revocation of a student's degree or certificate

It may also include community service, a written reprimand, and/or a written statement of misconduct that can be put into an appropriate record maintained for purposes of the profession or discipline for which the student is preparing.

Dept./College Research Policies

Please refer to the Policies and Compliance section of the Office of Sponsored Projects.

Orderly Dismissal from Research Group, Program

See above.

Dispute Resolution

RMCOEH, the Division of OEH, and the University of Utah encourage informal resolution of minor problems involving academic standards. Students are urged to discuss problems with the involved instructor(s), the RMCOEH Graduate Academic Advisor and the Director of OEH Graduate Studies. Faculty may place letters of concern of conduct in the student's file if warranted.

Formal Dispute Resolution

A more formal process is required when there is a serious violation or if a student is charged with either a second instance or multiple instances of academic misconduct. All accusations of cases of misconduct that are verified in the program review process will be documented in the student's file.

First Authorship

In all cases, and in all phases of publication, the student (and/or recent graduate of the OEH Graduate Programs) must coordinate publication(s) with their Supervisory Committee.

All students are directly and/or indirectly supported by funding from CDC/NIOSH and the state of Utah; thus, there is an imperative to publish the results of the research in return for the implicit trust placed in RMCOEH by U.S. and Utah taxpayers. As a general principle, students will be the first author on a publication that is the direct result of their thesis/dissertation. There are exceptions to first authorship that should be defined with the student and generally agreed upon early in the course of the identification of a thesis/dissertation topic. Reasons may include (1) the student is for some reason unlikely to be able to publicly defend the work; and (2) the research is the central thrust of the faculty member's research career, with clear expectations of follow-on grants to continue that line of work (the PI of the grant submission being the first author of publications is beneficial in the grant application process).

If the student's research is not published by their graduation date, the latest manuscript copy (or copies), datasets, and data analyses must be forwarded to their Supervisory Committee Chair prior to graduation.

If after graduation and up to six months after graduation the student continues to work with the Supervisory Committee Chair to lead the efforts to publish the results, then generally, the student may be accorded the right of first authorship.

If the timeline exceeds six months after the date of graduation and/or the work to publish falls on the RMCOEH/Division of OEH faculty/staff, the student will generally be removed from the position of first author.

In all cases, and regardless of first authorship by the student, the corresponding author will be the Supervisory Committee Chair. This is due to the problems of students naturally moving, being too busy to respond promptly to queries about the research while in a new career, family demands, etc.

B: Scientific Writing and Research Project Paper Style Expectations

B.1 Requirements and Guidance

The following guidelines apply to all writing conducted as part of the MSOH, MOH, and PhD Programs, unless provided other specific directions by an instructor. A helpful reference is *How to Write and Publish a Scientific Paper*, 8th Edition by Gastel B and RA Day (Santa Barbara CA: Greenwood Press, 2016). A specific organization and formatting style are required for the final written research work product for the MSOH, MOH, and PhD in OEH degree programs unless otherwise approved by the Chair of the Supervisory Committee and the Director of the OEH Graduate Studies. The specific formatting requirements depend on whether a student has opted to pursue a traditional thesis/dissertation or the academic paper(s) suitable for publication in a scientific journal. Academic papers should be written in the formatting required by the student's target journal for publication, which should be chosen in consultation with the Supervisory Committee. Failure to follow the prescribed formatting style guidelines will result in required revisions, irrespective of the content.

The formatting style for PhD dissertations is further specified by the Graduate School in *A Handbook for Theses and Dissertations*. Incorrect dissertation formatting may result in the Graduate School rejecting a dissertation, delaying graduation.

B.2 General Principles

The following general principles apply for all sections of writing, as well as other documents such as letters, reports, and other forms of communication in your careers.

1. Compose paragraphs.
 - Paragraphs should be limited to one topic.
 - There should be a main sentence for each paragraph -- usually the first sentence.
 - Paragraphs should not be unduly long.
 - Unnecessary repetition should be avoided.

2. Outline the thoughts you want to convey in each section. They will form your main sentences for each of a succession of paragraphs.
3. Papers should almost always be constructed in chronological order. Sequencing a paper's paragraphs in non-chronological order will tend to be illogical. Invariably, it is difficult to follow as the reader is challenged to ascertain the sequencing.
4. Use positive language.
 - Start by noting what you did and how.
 - Avoid beginning sections with what you did not do, or limitations and weaknesses.
5. Use formal language at all times.
 - Do not use contractions (other than a contraction within a required quotation).
 - Never use the ampersand (“&”) to denote “and.”
6. Simple sentences are desirable in scientific writing. Remember that the goal is to provide clear communication.
 - Use precise, direct language.
 - Do not assume the reader is an expert in the topic you are writing about.
 - Shorter sentences are better whenever possible. It will be more clearly understood. On the other hand, if a person who is a student in a program, or otherwise in life, if someone else writes in a long, wordy manner with multiple conjunctions and rambles in the belief this will help the writing style; and/or there is a belief this is a more advanced mode of communication; the student will have succeeded in producing a sentence the reader dislikes and makes the reader work harder which is not cognitive-ergonomically correct and not so infrequently, is somewhat confused about what the real intent of that given, rambling sentence, which can produce a series of interesting reactions in the reader that range the gamut from impatience to disgust to confusion to anger to a deep sigh, especially if the problem is repeated in other sentences and elsewhere, again in a mistaken belief of actually helping foster clarity of thoughts.
 - Minimize negative sentences.
 - Avoid double negatives unless essential.
 - Avoid semicolons. They have almost no use in formal scientific writing, as they are by definition compound sentences. Compound sentences invariably invite more difficulty in reading and comprehension. The sole exception is the use of semicolons to separate compound fragments in a list after a colon.
7. Avoid excessive wordiness. The fewer words, the better. For example, consider the following clause: “... at right angles in reference to the airflow inside the sample

chamber.” This may be simplified to: “perpendicular to the chamber airflow,” which reduces the reading burden from 12 to five words without loss of information.

8. Spell check carefully. Do not solely rely on the automated spell/grammar checkers, as they are particularly inadequate for scientific terms and technical writing.
9. Avoid extreme language. Use extreme language only when unequivocally apropos.
 - “Very” is a very bad word to use
 - Other extreme language is a warning flag for exaggeration (e.g.):
 - Always, constantly, continuously, continually, permanently
 - Never, nothing
 - Perpetually
 - Clearly, obviously, plainly, unmistakably
10. Avoid extending beyond what your data allow
 - The Results, Discussion and Conclusion sections should all be directly related to the methods and data you produced.
 - Avoid making statements or conclusions that your data don’t support.
 - There are exceedingly few papers so strong as to spur policy changes. Speculating on policy issues in the discussion section of the paper generally raises questions about biases, raises concerns about where else the author exaggerated, paradoxically reduces persuasion, and invites rejection. Authors must proceed cautiously, especially if other papers in the journal do not speculate in policy. A better process is to either: 1) avoid speculating on policy, then let the editor and peer reviewers decide if such language should be added, or 2) briefly comment that the results do/do not support policy ABC.
11. Data are plural and datum is singular. Watch verb tenses, as your spell/grammar checkers will often miss your errors. Data errors make you look non-scientific.
12. Be consistent. Select one style or convention and stay with it throughout your work. Do not change conventions within the same work. Pay attention to your writing—others will.
13. “E.g.” (exempli gratia) is “for example.” I.e., (id est) is “that is.” N.B. (nota bene) is “note well.” Please do not confuse these terms.
14. “Et al.” is used for three or more names.
15. With rare exceptions, use metric units and place Imperial units in parentheses, if included at all. Do not use abbreviations without first defining them. For example, hydrogen sulfide (H₂S).

16. Use generic names, rather than trade names, where possible. If a specific type of equipment is used to produce the results, and it is important for the reliability of the results or compliance with test requirements to specify the type of equipment, then note that name where first mentioned in the methods section. Elsewhere, use a generic term. For medications or trade name chemicals, only use the trade name if absolutely essential or if that name is nearly universally used and use of the generic name would produce confusion. Use the symbols TM and ® where necessary. Go to the appropriate website to determine how it should be referenced and whether a trademark is registered. Many websites dictate, near the bottom, how the property should be referenced.
17. When writing a number less than 1, use a zero in front of the decimal place so the reader sees the 0 (e.g., 0.05). Avoid .5, as it is too easy to read as “5” instead of “0.5.”
18. Do not use superscripted footnotes or references following numbers. Journal Club presenters have used conventions such as “60³” to refer to 60 with a footnote/reference of three. It reads as 60 cubed.
19. Understand “copyfitting.” Do not let your word processor break words, sentences, and paragraphs where it wants to. You may want to force, for example, line breaks—with a “soft” carriage return—so that the reader is better able to follow a sentence.
 - For example, don’t let “...a collision on I-15...” be printed as “...a collision on I-15...”
20. Do not start a sentence with a numeral. (It is acceptable to spell out the number, e.g., “one”). It is traditional to spell out numbers below “nine,” though there are exceptions, especially if the number refers to a unit of measurement (e.g., 4 kilometers). For example, “There were nine students in the study” is better than, “There were 9 students in the study.” However, use numerals if doing so helps the reader.
21. Consider the typeface used in your work. Be careful, and write as needed, if the characters “1” (numeral one), “l” (lower case “el”), and “I” (upper-case “eye”) are indistinguishable from one another in some san-serif typefaces. For example, does “1g” mean one g, “el” g, or “eye” g”?
22. The use of color has become more common in published literature in recent years. If the publication does not readily accept/print in color, avoid using color in graphs, and instead seek to use other types of lines and boxes/circles. If the publication does not charge a significant cost for using color, then use color where needed.
23. Consider investing the time to learn how to properly use dashes. There are three main types: the hyphen (-), the “en” dash (–), and the “em” dash (—). Each serves a different purpose and helps a reader better understand your writing. This is also important because you will, or should, read your writing more than anyone else. Therefore, it will benefit you the most.

- The hyphen (-) is used to form complex adjectives. If you write “third world war,” the reader is unsure if you mean World War III or a war within the third world. You should use “third-world” war if you mean the latter rather than the former.
- The “en” dash (–) should be used for a “minus” sign since “–0.05” stands out more than “-0.05.” This dash is also used for ranges. For example, “The time period 1914–1918,” rather than “The time period 1914-1918.”
- The “em” dash (—) may be used as a strong comma to add emphasis. An example of such a use is: “There are numerous statistical distributions available—for example, Gaussian, Poisson, and binomial—to the researcher.”
- There is some variance in styles for these three dashes, but it will serve you well to know these tools for your writing and presentations.
- Each can be inserted through simple keystrokes with MS Word as well as through the “Insert” function.

24. Figure names go below figures. Table names go above tables. Learn how to align numbers within tables. Numbers are rarely left-justified. They may be centered in a column if they remain easily readable. Know how to align decimal points where needed. Do not mix left-, center-, and right-justified content—numbers or characters—within a column.

Buy, or get access to, one writing-style handbook, become familiar with it, and utilize it in your writing. It may be AAP, MLA, Chicago, or AP, but be consistent with whichever one you select.

Your writing may be the only contact you ever have with some readers and audiences. Leave behind the best possible impression. Remember, others will continuously judge you by your writing ability throughout your career.

In closing, remember that your writing—whether in a report, paper, or a presentation—is an “essay.” You are attempting to get readers to agree that your work is valid and your conclusions sound. Make it easy for them to come to a “yes.”

B.3 MSOH/MOH Research Project Structure and Formatting

When starting a research project, it is important to keep track of information continuously and systematically. This includes, but is not limited to: writing a formal study protocol; writing down methods that deviate from your study protocol; recording data; documenting statistical analyses; and noting what you are thinking as you read literature, collect data, or perform analyses. Having discipline to write as the work proceeds will minimize the risk that necessary information is missing after the data collection or research project is finished. And you will have a lot of words already written for the first complete draft.

Titles: Titles explain research results succinctly.

Journal selection: Carefully consider 1) the strength and generalizability of your results and 2) what journal(s) have published similar work previously. Select the target journal with input and approval from your Supervisory Committee. Format the article based on the “Instructions for Authors” for that journal. The journal you select may also influence the amount or type of background and introductory material needed, and the framing of the research.

Spacing: All manuscripts must be double spaced throughout, without exception. **Font:** Use a readable font like Arial or Times New Roman in 12-point size. **Margins:** Use 1-inch margins.

Abstracts: Abstracts vary in length but generally are approximately 250 words and structured using subheadings. For purposes of the OEH Graduate Programs, all students should use a structured abstract with four subheadings -- Introduction, Methods, Results, Conclusions -- even if the target journal does not use a structured abstract. The subheadings can later be deleted, yet the content will be preserved. (Lack of structuring most frequently results in omissions or attempts to combine multiple thoughts into one sentence, resulting in lack of clarity.)

Introduction: Introductions are usually about three to five well-referenced paragraphs, with a three-paragraph minimum. The trend over the past several decades has been toward more succinct but complete introductions. The most successful strategy for paragraph construction usually involves the following three (or more) paragraphs that have sometimes been described as “telescoping”:

1. Overview paragraph with the major outcome regarding the research topic (e.g., numbers of people affected, prevalence rate, incidence rate, costs of the ‘big’ problem, morbidity, injuries, disability [e.g., how many people worldwide are affected by silicosis, how many people die per year from silicosis]).
2. Second paragraph that reviews what is known specifically about the area of this research project (i.e., identify what is known but also what the ‘hole’ in the knowledge base is [e.g., prior studies of solubility of silica to produce silicosis]).
3. Third paragraph is the hypothesis for the research project.

Depending on the specific topic, there may be a requirement for additional paragraphs to sufficiently review the background material for your hypothesis.

Each paragraph should include a main summary/topic sentence. Data should be quantified where possible in the sentences. All facts should be well referenced. It is generally better to use higher-quality, original references than systematic or other reviews. If using a systematic review, it should be rigorous, such as a Cochrane review. No more than one subject per paragraph should be included. (A background section may be required by a student’s Supervisory Committee. If so, it is to be attached as an appendix. See below.)

Methods: A succinct summary of the results. This must include the study design in the first sentence. It must also include animals/cells/samples/population studied. It usually includes data collection methods.

Independent and dependent variables must be specified. Important confounders or covariates should be mentioned, though all confounders are generally not able to be included in succinct abstracts. The basic analytical approach should be included.

The study IRB approval (or animal subjects) should be noted in the first sentence, including the approval number.

The study design is stated.

The methods should be reviewed in chronological order (so the reader can follow the research 'story').

- Study setting, location, dates data were collected, exposure, follow-up
- Before IH or safety studies can collect exposure information, the study must be approved by the IRB

The cell, animals, human subjects, population studied is specified in detail.

- Inclusion and exclusion criteria
- How was your population selected?

The exposure(s) [independent variable(s)] should be described in detail.

- Make sure to explain all the variables presented in your tables and figures

The dependent variable(s) should be described in detail.

- How where they collected? Did you manipulate your variables?

Covariates should be described. (For epidemiological studies, these are often discussed in one or two paragraphs with the exposures above).

- How where covariates chosen and why?

The analytical methods used to measure should be included in the above paragraphs.

Statistical methods should be described in a complete, but succinct paragraph or two at the end of the methods section. The statistical package used should be noted, including the version. Statistical testing generally follows a well-defined, sequential plan. The text should convey that systematic, logical, sequential approach.

- Did you have missing data? How were missing data points addressed?
- Were data points imputed? How? How many data points (N or %)?
- Did you check for interactions? Normal distribution? Correlations?

Results: Succinct summary of the main results. Generally, report only multivariate model results in the abstract. This should include main quantified results and confidence bounds, not merely qualitative results.

The sequence is essentially always chronological.

For epidemiological studies, the first paragraph describes the basic epidemiology (e.g., prevalence, distribution of demographic variables). The basic descriptive variables are usually in Table 1.

- How many subjects were enrolled? Did you exclude subjects in your final analyses -- why?
- Consider using a flow diagram. Many types of studies now require flow diagrams as a clarity and quality measure.

Univariate analyses are in Table 2. A paragraph describes key univariate findings, though not all findings. Multivariate analyses are in Table 3. A paragraph (or more) describes key multivariate findings, though not all findings.

- What did you adjust for, how, and why?

There may be more than one paragraph for each of the above components of the results but rarely more than two paragraphs. Recognize that some readers start with the tables. Thus, all tables should be clearly labeled. They should be viewed as standalone ‘tables of results,’ meaning they should have informative captions and no undefined abbreviations; footnotes may be used to define abbreviations, denote statistical significance, identify the statistical test, identify covariates in a multivariate model, or provide other information as necessary.

Figures should be included where they help the reader understand the methods, equipment, or results. Information that is not easily conveyed through other means should be represented in a figure. Like tables, figures should be able to be understood without the text and require informative captions.

Discussion: The first paragraph should summarize the main results. The first sentence should hit the main conclusion of the entire research paper. Do not refer to a specific table or figure. However, discuss the results. The second paragraph generally includes how the results compare with prior results and the degree of significance.

Either a paragraph on the study strengths or including the study strengths in the first paragraph or in the beginning of a later paragraph with limitations is usually necessary.

There must be a paragraph addressing limitations of the study. This paragraph should include how the limitations were addressed, where appropriate. A cautious, rational statement regarding whether the results should stand despite the limitations is appropriate. Sometimes, the strengths and limitations are combined in one paragraph. That is only appropriate when there are few to discuss. Otherwise, confusion will likely occur. Sometimes, a recommendation for additional research is suggested. However, a general statement to that effect is trite. If included, a precise recommendation of the specific study design as the next step is preferable. The last paragraph of the discussion should succinctly summarize your results. Avoid direct duplication of prior sentences.

Conclusions: Usually a one-sentence conclusion and occasionally two sentences. Do not speculate beyond the boundaries of your data. What is your take-home message?

References: A list of all printed literature, websites, e-journals, videos, conference proceedings, posters, radio and television programs, laws and statutes, codes and standards, personal communications, or any other sources from which information was used and/or cited within the text. This should be formatted consistently and according to the guidelines of the journal targeted for publication.

References should be numbered in the order they appear in the manuscript. If there is a clear journal that your Supervisory Committee wishes you to utilize, follow the referencing style for that specific journal. Otherwise, follow the APA style. Make sure the references are complete. In addition to each reference entry being complete, pay special attention to how/where the journal uses bold, italics, capitalization, and quotation marks to convey specific publishing information. For example, journal titles usually use a headline style capitalization scheme, whereas article titles are placed in quotation marks or use a sentence style capitalization scheme. It is recommended to use Endnote for referencing.

Background: A background section contains information that is not publishable, yet is necessary to conduct the research. It may include definitions of TLV, PEL, or similar terms. It may describe the purposes and limitations of statistical tests used in the research. It may describe the history of the test. In short, the background section includes a relatively long and tangential discussion of various aspects of the research that are typically NOT found in a research publication.

As the background section would make the paper ‘unpublishable,’ it is to be included as an appendix only if your Supervisory Committee feels some information needs to be included. Then, it can readily be omitted without having to re-sequence the references in the text or otherwise substantially rework the paper for submission.

If your Supervisory Committee does not require a background section, recognize some questions during the defense often originate with, and then advance from, this background material. In short, know everything there is to know about your topic and research.

B.4 PhD Dissertations

Most PhD students opt to write three academic papers suitable for publication in a peer-reviewed journal rather than a traditional dissertation. Formatting and content of the three academic papers should follow the guidelines presented in the section above. Students should coordinate their efforts with their Supervisory Committee Chair.

C: PowerPoint Slide Presentation Guidelines

The first step with PowerPoint slides presentations is to determine what the desired outcome or "goal" is for the learner. The goal of the presentation is broad and generally describes the ideal outcome of the presentation. The goal is supported by objectives.

Objectives are best phrased as learner centered and contain an action verb at the appropriate learning level, which is typified by Bloom's taxonomy (e.g., Recall/Know, Apply, Analyze, Synthesize, or Evaluate), and specify the outcome the learner should achieve. Note that the educational content must match the level of education in your presentation (e.g., one cannot ask learners to apply an ergonomic job analysis method if we only describe it to convey knowledge about it). Countless examples of objectives are available in course syllabi. It is not essential, and indeed may be distracting, to include those objectives in the presentation. However, an excellent presentation will invariably incorporate these principles.

To accomplish the development of the overall goals and objectives, determine the three main points the learner should recall from the presentation. Ensure that those three main points are: a) detailed in the presentation, generally not more than one major point per slide and generally with the main subject in the title of that slide, and b) summarized adequately in the final conclusions slide, again generally no more than one major point per bullet.

Plan to leave some time for questions and answers. Recognize that experience has repeatedly shown presenters will need at least one minute per slide, regardless of how fast they go through them during a review. The following are guidelines for formatting of slides:

1. Generally, use dark background and light print. If you choose the reverse, about one size larger font size is required for the same reading ability in the audience. Light backgrounds, although popular, also produce more eye strain. Pick a background that complements the text. Include pictures, graphs, and tables. Use them where they help to illustrate points. These 'liven' a presentation.
2. Tables of data should be legible and not full of incomprehensible numbers. The amount of information should be sufficient to make your quantitative point. For example, consider using large font for the point estimate and smaller font for the 95% confidence bounds. Consider using underlining or bold text to draw the

audience to statistically significant results.

3. Be careful of video clips. Use the length of a video clip necessary to make the point rather than allow a video or two to become your talk. Use video clips when all of the following conditions are met:
 - They are succinct
 - They are the best method to illustrate the point
 - That point is important for understanding the topic
 - There is sufficient time to ensure they function prior to the talk
4. Avoid being too 'cute' with special effects, which are distracting, e.g., fly-ins, music, etc.
5. Always list the source to credit copyrighted information. Delete those copyrighted materials from handouts.
6. Generally, try to place a picture as well as text on the same slide, rather than merely a picture on a slide. This allows the inclusion of key bullets and the reader both sees the words and image they are to recall. Exceptions include the need for the entire slide to visualize the information on the picture.
7. Know the audience. Be wary of including jargon. Beware of including excessive scientific terms if they are beyond the average learner. Minimize use of acronyms. Spell out all but the most common acronyms the first time used. Do NOT expect an uninformed audience to be able to track three acronyms throughout a presentation.
8. Size of typeface should generally not be less than 24 pt. (e.g., Times New Roman, Times, Arial, Helvetica). Twenty-two (22) pt. is small and should be used only when the room environment is optimal (i.e., lack of bright lighting especially on/behind/near the screen, large screen available, seats not too far removed from the screen). Try limiting to only eight lines per slide in addition to the title.
9. The inclusion of an illegible, busy slide with the common phrase of "I know this slide is not hard to read but" is unacceptable and may be considered an insult to the audience. A polished presenter will either adjust the table/figure/slide or otherwise make changes to make the slide readable, e.g., instead summarizing the desired point(s) in one or two lines. If there is a copyrighted diagram that is unacceptably small on a slide, it is often suboptimal but may be reasonable to provide a printed copy with time to explain it during the presentation.
10. Use bullets, not sentences. Never place multiple sentences under a single bullet.
11. Do not use whole sentences on a slide--instead list topics you will discuss. The goal is to place essential information on the slides. Useless words distract the reader

from listening to you and they may get lost in the text.

12. E.g., remove nearly all articles from the slides. "The" and "a" are almost never needed. They add reading burden without useful information.
13. Carefully evaluate prepositional phrases. They can often be eliminated without loss of information.
14. It is a good idea to have someone else review your presentation to see if they identify errors. At minimum, review it at least a day after creating it so your eyes are a bit fresher to hopefully catch errors or problems.
15. Always put page/slide numbers on slides so that questions may be directed to "slide number 21" instead of "go back to the slide with that green diagram on it."
16. Be careful with overuse of abbreviations such as: w/, vs, yrs, hrs, etc.
17. Consider putting your name as well as the title and date of your presentation on each slide. If someone later uses your slides—it has been known to happen—then you will be credited. Of course, another person may choose to remove your name, but that is on them, not on you.
18. Follow some of the same rules as described in B2. General Principles for writing.
19. A presentation is not an excuse to be sloppy in your writing since slides are often forwarded with associated papers or reports. The presentation is also your writing.
20. Regardless of whether you did a great or a horrible job of actually presenting your slides, your slides will live on without your narrative. Make sure that they stand on the student's own.

Lastly, revisit the content to ensure the presentation meets your goal(s) and objectives. Confirm the length of the talk. Remember the "one slide per minute" rule. Jamming more slides in usually gives a rushed appearance. A better solution is to reduce the number of slides without sacrificing the evidence in support of the three main points to be made. Be sure you incorporate sufficient time for questions and answers. Finish your presentation on time!

D: Oral Presentation Guidelines

Do:

1. Make sure all electronics, adequate sound/microphones, lighting and room environment issues are satisfactorily addressed in advance. Ensure the PowerPoint

or other presentation materials are fully functional in the assigned room's system.

2. Talk to the audience, not to the screen. If there is no screen in front of the presenter on the podium and the screen is behind the speaker, there are roughly three options: i) know the presentation well enough such that only a glance at the screen is required prior to speaking to the audience, ii) have the PowerPoint slides printed out on paper and hold that for guidance to better facilitate speaking to the audience, and/or iii) use a separate computer screen to speak from the podium even if it is not connected with the projector.
3. Seek to use a friendly, non-confrontational speaking style. Confrontational speaking styles may inadvertently occur when individuals either lack public speaking experience and/or have relatively low level of familiarity with the subject matter. Subject content review and practice helps reduce these issues.
4. Make eye contact. Typically pick out a few individuals around the room to talk with as others will think you are talking with them too.
5. Consider judiciously, skillfully incorporating people in the audience into the talk if helpful. This should be done cautiously, as it can be interpreted as confrontational. However, an example includes giving thanks to someone who has taught a major point is a strong positive.
6. Do use an anecdote(s). Listeners typically respond well, if not better, to anecdotes than routine didactic material. Seek to use perhaps one or two in a 45-minute presentation. Avoid excessive use of anecdotes, though, as that may detract from the main message(s). One brief anecdote is typically sufficient for a 20-minute presentation. Some presentations, such as thesis defenses, may not lend themselves to anecdotes.
7. Do consider brief use of humor. Humor provides some variety that helps maintain attention. However, avoid excessive or prolonged humor as it implies a lack of seriousness.
8. Do consider polling audiences or otherwise involve audiences in presentations, especially if beyond 20-30 minutes. This may not be reasonable for 20-minute presentations such as theses thesis defenses. However, for longer presentations, audience involvement, polling for multiple choice questions, asking questions and seeking raised hands all encourage attention and improve learning and retention.
9. Students should refer to every slide at some point during the presentation. Use a laser pointer discretely, not continuously. Do not use the pointer to wander in circles over slides. Optimal use is to point to, or focus on a feature on a picture that cannot be readily described or to a specific topic you will discuss.

10. Practice your presentation. Use a camera or phone to record your presentation one to three times. View the recording(s) to ensure your body language conveys confidence (no folded arms or hands tightly clasped in front of the body), your voice is easily heard (no awkward pauses, mumbling, or too soft spoken to be heard), and there are no distracting ticks in your body language, eye contact, or speech (no stiffness or gesticulating gestures; no looking down or making eye contact too briefly or too long; no space-fillers such as ums, uhs, ya' knows, etc.).
11. Be sure to do a final run-through of the presentation the night before. Sleeping on it overnight seems to jell the presentation and facilitates a smoother, polished style.
12. Pace yourself. Know when you are approximately 1/3 or 1/2 way through the presentation and compare with the time allotment.
13. Give thanks to the audience for the student's time, input, help, or other assistance as appropriate at the end of the presentation.

Don't:

1. Do not read word for word from a slide.
2. Do not use ums, uhs, heys, ya' knows, and other "space-fillers." It is better to not say anything and collect your thoughts than use a space filler that distracts and detracts. (Become comfortable with short silences.)
3. Do NOT go over time. Time is money, and going over time can be fatal for you, your thoughts, your proposal, your application and/or your program.

E: Guidelines for Use of Social Media

Use of social media is prevalent. OEH Graduate Programs students (includes MSOH/MOH/PhD and other RMCOEH-associated degree programs) should be aware that unwise or inappropriate use of social media can negatively impact educational and/or career opportunities. To avoid these negative impacts, students should consider the following:

- Post content that reflects positively on you, RMCOEH, and the University. Be aware not only of the content that you post, but of any content that you host (e.g., comments posted by others on your site). Content you host can have the same effect as content you post.
- Though you may only intend a small group to see what you post, a much larger group may actually see your post. Be aware that your statements may be offensive to others, including classmates, faculty members, or prospective employers who

may read the post.

- Employers and others increasingly use social media to screen and evaluate applicants. Choosing to post distasteful, immature, or offensive content may eliminate job opportunities, by precluding the opportunity for an interview.
- Once you have posted something via social media, it is out of your control. Others may see it, repost it, save it, forward it, etc.
- If you post content concerning the University, make it clear that you do not represent the University and that the content you are posting does not represent the views of the University.
- Make sure the content you post is in harmony with the ethical or other codes of your program and field. In certain circumstances, your program may have made these codes binding on you, and violations may result in legal and/or professional action(s) against you.
- Essentially all RMCOEH students eventually obtain or see confidential information, e.g., about businesses, workers, and/or patients. Never disclose confidential information. The University may act against you for disclosures of confidential information.
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Date Created: September 2021 **Last Revised:** July 2024

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**Tenure or tenure-track for OEH

***Graduate School approval needed to serve on OEH Supervisory Committees