



CURRICULUM

Bachelor of Science Program in Occupational Health and Safety

(Revised Curriculum, 2023)

**Department of Occupational Health and Safety
Faculty of Public Health, Mahidol University
Bangkok, Thailand**



Details of Curriculum

Bachelor of Science Program in Occupational Health and Safety (Revised Curriculum, 2023)

Name of Institution	Mahidol University
Campus/Faculty/Department	Faculty of Public Health Department of Occupational Health and Safety

Section 1 – General Information

1. Title of Program

Thai: หลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาอาชีวอนามัยและความปลอดภัย

English: Bachelor of Science Program in Occupational Health and Safety

2. Title of Degree and Major

Full Title in Thai: วิทยาศาสตรบัณฑิต (อาชีวอนามัยและความปลอดภัย)

Abbreviation in Thai: วท.บ. (อาชีวอนามัยและความปลอดภัย)

Full Title in English: Bachelor of Science in Occupational Health and Safety

Abbreviation in English: B.Sc. (Occupational Health and Safety)

3. Major/Concentration - none -

4. Total Required Credits Minimum of 140 credits

5. Curriculum Characteristics

5.1 Type: Bachelor Degree Program (Technical Degree)

5.2 Duration: 4-year Program

5.3 Language: Thai

5.4 Degree Offered to the Graduates: Single Degree



6. Development of Curriculum

Mahidol University was the nation's first academic institute to offer the degree program in Occupational Health and Safety. Dated back to 1969, the Faculty of Public Health initiated the Bachelor Program in Occupational Health and the first batch of students graduated later in 1970. Over 5 decades of experience in teaching and learning, the curriculum has been continuously developed to be in line with the national and international occupational health and safety situations, emerging issues, changes in world of work and lifestyles. Current and future determinants of health in connection to industrial expansion and technological advancement such as use of chemicals and modern machinery in the production process including the application of digital technology (digital transformation), artificial intelligence (AI) or robotics to replace humans, *etc.*, have also been considered. Although there have been a remarkable progress in the development of laws and government policies that place greater emphasis on occupational health and safety, the trend of work-related accidents and injuries are still high. It has been recognized that occupational health and safety personnel is a key mechanism for the administration at all levels. As a result, graduates with skills and abilities that balance both versatility and specificity in response to the type of industry are in demand. Curriculum development therefore focuses on developing graduates to be fulfilled with knowledge, competences and skills that are consistent with such changing needs and situations, as well as contributing to the Sustainable Development Goals (SDGs) of the United Nations. The relevant ones are Goal 3 – Good Health and Well-being, and Goal 8 – Decent Work and Economic Growth.

Mahidol University has a mission that aims to become a world-class university and the wisdom of the land by creating excellence in health, science, art and innovation based on virtue for the Thai society and for the benefit of mankind. The University has been outstanding in producing graduates in medicine and public health for a long time. In order to achieve the ultimate goal and the mission, four main strategies are administered: 1) Setting obvious goals and focusing on achievements for the betterment of Thai society and the benefit of mankind, 2) Creating new knowledge and the culture of innovation, 3) Modifying the learning process by applying the concept of intellectual education to develop students' internal potential; and 4) Building organizational culture, teamwork and creation of integrated body of knowledge.

The Faculty of Public Health has set out its vision of being the home of national and international public health leaders. Faculty members contribute to the development of public health professionals through an innovative and hands-on learning process, for recognition of excellence at national and global levels. The Faculty also emphasizes on research and development in public health and environment through integrated research and innovative with skill in ethical research. The results of research were delivered to government and private sector for developing public policies, bringing about sustainable development for public health and environment.



Academic services in public health are conducted either in urban or rural communities as well as in industrial settings. Such services include mobile health checkup, public health and environmental laboratory analyses, industrial hygiene and safety assessment, *etc.* Several health promotion projects are ongoing with special emphasis on integrated work with the communities so that the outcomes are beneficial to the people at large.

The Bachelor of Science Program in Occupational Health and Safety has been developed under a conceptual framework that focuses on the philosophy of “Learning Centered, Outcome-based Education, and Constructivism” to produce graduates with potential in line with the missions of the 12th National Education Plan (2017-2036), that is, to have knowledge, characteristics and learning skills in the 21st century. Our curriculum has been continuously improved with respect to the changed situation and relevant contexts to meet the needs of markets and all stakeholders, and the international standard certification guidelines. Graduates are expected to achieve all Program Learning Outcomes (PLOs) with knowledge, skills and overall competence to work in the promotion, prevention and control of occupational health and safety problems towards the goal of building a culture of prevention in a sustainable manner, both at the corporate and national levels. They are also expected to be able to develop their potential in terms of learning, skills, morals, ethics and other characteristics in order to be a change leader that benefits society at large, as “Global Citizen and Global Talents” together with the life-long learning.



Section 2 – Philosophy, Program Objectives, and Program–Level Learning Outcomes

1. Philosophy

The Bachelor of Science Program in Occupational Health and Safety has defined the expected learning outcome of the learners, program structure and administering education in line with the vision and mission of Mahidol University and the Faculty of Public Health. The Mission of Mahidol University is to excel in health, sciences, arts, and innovation with integrity for the betterment of Thai society and the benefit of mankind and university's determination is the wisdom of the land. Administering education is designed according to Mahidol University's Educational Philosophy through learning-centered approach, outcome-based education, and constructivism with new knowledge and with experiential learning activities.

This curriculum has been focused on the development of graduates who have multidisciplinary knowledge including health, public health, engineering, science, technology, and environment. In addition, they are competent to be an occupational health and safety professional, to protect workers' health and safety and community at large, as well as practicing morality, ethics, and their career's code of conduct.

2. Program Objectives

The program aims to produce graduates who are able to:

- 1) Apply basic and specific knowledge and principles in occupational health, safety and working environments for the prevention and control of work accidents and illnesses.
- 2) Work in the occupational health and safety profession with morality, ethics, and public mind.
- 3) Create and develop occupational health and safety activities for improving health and quality of life of workers.
- 4) Demonstrate effective communication skill to transfer knowledge, opinions, and advice on occupational health and safety to workers and relevant parties.
- 5) Interact with multi-disciplines in working as a team, and perform work with good leadership or followership.



3. Program Learning Outcomes (PLOs)

Upon completion of the program, the graduates are able to:

- PLO1** Demonstrate the role of OH&S with professional morality and ethics in protecting and promoting the health and safety of workers.
- PLO2** Execute occupational and work-related hazard identification accurately in accordance with national and international legal regulatory requirements or standards.
- PLO3** Evaluate risks in relation to health and safety at work accurately in accordance with the type or context of business establishment.
- PLO4** Design measures to manage and control risks in relation to health and safety at work in accordance with national and international legal and regulatory requirements or standards.
- PLO5** Apply communication and digital skills to develop and disseminate occupational health and safety practices in accordance with the nature of the work and the targeted groups.
- PLO6** Demonstrate cooperative performance with other professionals to achieve objectives of occupational health and safety practices.



Section 3 – Educational Management System, Curriculum Structure, Course of the Program and Credits

1. Educational Management System

1.1 System Semester System

1.2 Summer Sessions - No -

1.3 Credit Equivalence Ratio (In Reference to Semester System)

Complies with the Commission on Higher Education Standards' criteria for bachelor's degree program B.E. 2009 and followed the requirements in the regulation of Mahidol University on Undergraduate Study.

- 1) Theoretical Course that consists of 1 hour of lecture or discussion and no less than 15 hours per week and self study 2 hours per week throughout the regular semester is equivalent to 1 credit.
- 2) Practical Course that requires 2 to 3 hours per week, 30 to 45 hours in total over the regular semester, is equivalent 1 credit.
- 3) Internship/Field work that requires 3 to 6 hours per week, 45 to 90 hours in total and self-study 1 hour per week or 15 hours in total over the regular semester, is equivalent to 1 credit.

1.4 Academic System

- In Class
 - Distance Learning, mainly through Printed Materials
 - Distance Learning, mainly through Broadcast Media
 - Distance Learning, mainly through Electronic Media (e-Learning)
 - Distance Learning through the Internet
 - Others (please specify)
-

1.5 Credit Transfer and Cross-institutional Enrollment (if any)

- No -



2. Curriculum

2.1 Number of Credits

The required number of credits in total shall not be less than 140 credits.

2.2 Curriculum Structure

The structure of this curriculum is designed in accordance with the Commission on Higher Education Standards' criteria for bachelor's degree program B.E. 2022.

1) General Education	not less than	30 Credits
1. MUGE 100 General Education for Human Development		3 Credits
2. Languages	not less than	9 Credits
3. Literacy*	not less than	12 Credits
4. LAEN 266 English for Health Science		3 Credits
5. ITCS 155 Computer Applications		3 Credits
2) Specific Courses	not less than	104 Credits
1. Basic Sciences & Maths (Core Courses)		32 Credits
2. Public Health & Occ. Health and Safety (Required Courses)		66 Credits
3. Elective Courses	not less than	6 Credits
3) Free Electives	not less than	6 Credits

* Mahidol University has designated 6 clusters of literacy courses for undergraduate students, including: 1) MU Literacy,

2) Health Literacy (Health & Sport),

3) Science and Environmental Literacy,

4) Inter Cultural & Global Awareness Literacy,

5) Civic Literacy, and

6) Finance and Management Literacy.

Each student must complete all 6 literacies by enrolling at least 1 course (2 credits course) in each literacy cluster.

2.3 Courses in the Program

2.3.1 Course Codes

In line with Mahidol University's format, course codes for the Bachelor of Science Program in Occupational Health and Safety consists of 4 alphabets and 3-digit numbers (displayed as "XXYY zzz"). Credit hours are shown as number in front of the bracket, and total hours for learning experience (Theory – Practice – Self-study) are in the bracket (displayed as "a (b-c-d)". Detailed designation of these codes is explained as follow:



A. Course code consists of 7 characters, divided into 2 parts:

1) The four letters (XXYY), with the following meanings:

– The first two letters is the code of the faculty or institute responsible for the management of teaching and learning of that course, for examples:

มม : MU — Courses administered by Mahidol University, for all faculties

สส : PH — Courses administered by the Faculty of Public Health

วท : SC — Courses administered by the Faculty of Sciences

ศส : LA — Courses administered by the Faculty of Liberal Arts

– The last two letters is the code of the department or program in charge of that course faculty or institute responsible for the management of teaching and learning of that course, for examples:

ชส : BS — Department of Biostatistics

รบ : EP — Department of Epidemiology

สข : HE — Department of Health Promotion and Behavior

ออ : OH — Department of Occupational Health and Safety

2) The 3-digit numbers (zzz), with the following meanings:

– The first number (z_1) refers to the year of study in which the course is offered.

– The last two numbers (z_2z_3) refer to the order in which the course is offered for that class year of study.

B. Credit hours and total hours of learning experience, divided into 2 parts:

1) Credit hours for each course specified in front of the bracket (a)

2) Total hours for learning experience specified in the bracket: Theory (b) – Practice (c) – Self-study (d)

2.3.2 List of Courses

A. General Education not less than 30 Credits

1) Courses required by Mahidol University

MUGE 100 General Education for Human Development	3 (3-0-6)
LATH 100 Art of Using Thai Language in Communication	3 (2-2-5)
LAEN 103 English Level I*	3 (2-2-5)
LAEN 104 English Level II*	3 (2-2-5)



LAEN 105 English Level III*	3 (2-2-5)
LAEN 106 English Level IV*	3 (2-2-5)
XXYY zzz Literacy 1 (MU Literacy)**	2 (a-b-c)
XXYY zzz Literacy 2 (Health Literacy)**	2 (a-b-c)
XXYY zzz Literacy 3 (Science and Environmental Literacy)**	2 (a-b-c)
XXYY zzz Literacy 4 (Inter Cultural & Global Awareness Literacy)**	2 (a-b-c)
XXYY zzz Literacy 5 (Civic Literacy)**	2 (a-b-c)
XXYY zzz Literacy 6 (Finance and Management Literacy)**	2 (a-b-c)

2) Courses required by the Program

LAEN 266 English for Health Science	3 (3-0-6)
ITCS 155 Computer Applications	3 (2-2-5)

* *Two English courses (LAEN xxx) are required for each student based on the placement test score.*

** *At least one course (2 credits) in each of the 6 literacy cluster is required by the University.*

B. Specific Courses not less than 104 Credits

1) Basic Sciences & Maths (Core Courses) (32 credits)

SCBI 115 Basic of Life	2 (1-2-3)
SCBI 124 General Biology I	2 (2-0-4)
SCCH 102 General Chemistry	3 (3-0-6)
SCCH 118 Chemistry Laboratory	1 (0-2-1)
SCCH 129 Basic Organic Chemistry	3 (3-0-6)
SCCH 128 Organic Chemistry Laboratories	1 (0-3-1)
SCPY 159 Elementary Physics for Health Science	3 (3-0-6)
SCPY 110 General Physics Laboratory	1 (0-3-1)
SCMA 162 Calculus and Introduction to Ordinary Differential Equations	3 (3-0-6)
SCBC 203 Basic Biochemistry	3 (3-0-6)
SCBC 204 Basic Biochemistry Laboratories	1 (0-2-1)
SCPS 202 Basic Physiology	3 (2-3-5)
SCMI 203 Basic Microbiology	3 (2-3-5)
SCAN 211 General Human Anatomy	3 (2-3-5)

2) Public Health & Occupational Health and Safety (Required Courses) (66 credits)

PHHE 251 Health Promotion and Behavioral Change	2 (2-0-4)
PHOH 202 Principles of Occupational and Environmental Health	2 (2-0-4)



PHOH 203 Industrial Hygiene	2 (2-0-4)
PHOH 204 Principles of Engineering for Occupational Health and Safety	3 (2-2-5)
PHBS 303 Biostatistics	3 (3-0-6)
PHEP 306 Principles of Epidemiology and Its Application	3 (3-0-6)
PHOH 313 Industrial Process and Hazards	2 (2-0-4)
PHOH 317 Industrial Safety	3 (3-0-6)
PHOH 325 Safety Engineering and Technology	2 (1-2-3)
PHOH 326 Occupational Ergonomics	2 (2-0-4)
PHOH 327 Industrial Toxicology	2 (2-0-4)
PHOH 328 Occupational Medicine and Health Surveillance	3 (2-2-5)
PHOH 329 Occupational Health Psychology	2 (2-0-4)
PHOH 330 Risk Assessments in Safety and Health	3 (3-0-6)
PHOH 331 Prevention and Control of Fire and Chemical Emergency	3 (2-2-5)
PHOH 332 Laws and Ethics in Occupational Health and Safety	3 (3-0-6)
PHOH 333 International Standards on Occupational Health and Safety	2 (2-0-4)
PHOH 334 Occupational Health and Safety Administration	2 (2-0-4)
PHOH 387 Safety Practice in Establishments	3 (0-18-3)
PHOH 446 Industrial Hygiene Sampling and Analysis	3 (2-2-5)
PHOH 447 Industrial Hygiene and Safety Practice	2 (1-2-3)
PHOH 462 Occupational Diseases and Prevention	2 (2-0-4)
PHOH 463 Industrial Ventilation and Air Pollution Control	3 (3-0-6)
PHOH 464 Research & Seminar in Occupational Health and Safety	2 (1-2-3)
PHOH 465 Digital Transformation and Innovation in Occupational Health and Safety	2 (1-2-3)
PHOH 490 Professional Field Practice and Senior Project	5(0-30-5)

3) Electives in Occupational Health and Safety (not less than 6 credits)

PHOH 335 Current & Emerging Issues in Occupational Health and Safety	2 (2-0-4)
PHOH 466 Safety in Logistics and Transportation	2 (1-2-3)
PHOH 467 Process Safety Management and Prevention of Major Accidents	2 (1-2-3)
PHOH 468 Hazardous Materials and Industrial Waste Managements	2 (2-0-4)

C. Free Electives not less than 6 Credits

Upon their interests or as recommended by the academic advisors, students can enroll in various undergraduate level courses offered by Mahidol University.



2.4 Study Plan

Academic year / Subject code / Course*			Credits
1st Year			
1	MUGE 100	General Education for Human Development	3 (3-0-6)
2	LATH 100	Art of Using Thai Language in Communication	3 (2-2-5)
3	LAEN 103-5	English Level 1-3	3 (2-2-5)
4	LAEN 104-6	English Level 2-4	3 (2-2-5)
5	ITCS 155	Computer Applications	3 (2-2-5)
6	XXYY zzz	Literacy 1 – MU Literacy	2 (b-c-d)
7	XXYY zzz	Literacy 2 – Health Literacy (Health & Sport)	2 (b-c-d)
8	XXYY zzz	Literacy 3 – Science and Environmental Literacy	2 (b-c-d)
9	XXYY zzz	Literacy 4 – Inter Cultural & Global Awareness	2 (b-c-d)
10	XXYY zzz	Literacy 5 – Civic Literacy	2 (b-c-d)
11	XXYY zzz	Literacy 6 – Finance and Management Literacy	2 (b-c-d)
12	SCBI 115	Basic of Life	2 (1-2-3)
13	SCBI 124	Basic Biology I	2 (2-0-4)
14	SCCH 102	General Chemistry	3 (3-0-6)
15	SCCH 118	Chemistry Laboratory	1 (0-3-1)
16	SCCH 129	Basic Organic Chemistry	3 (3-0-6)
17	SCCH 128	Organic Chemistry Laboratories	1 (0-3-1)
18	SCPY 159	Elementary Physics for Health Science	3 (3-0-6)
19	SCPY 110	General Physics Laboratory I	1 (0-1-5)
20	SCMA 162	Calculus and Introduction to Ordinary Differential Equations	3 (3-0-6)
2nd Year			
21	LAEN 266	English for Health Science	3 (3-0-6)
22	SCBC 203	Basic Biochemistry	3 (3-0-6)
23	SCBC 204	Laboratories Experiments in Basic Biochemistry	1 (0-3-1)
24	SCPS 202	Basic Physiology	3 (2-3-5)
25	SCMI 203	Basic Microbiology	3 (2-3-5)
26	SCAN 211	General Human Anatomy	3 (2-3-5)
27	PHHE 251	Health Promotion and Behavioral Change	2 (2-0-4)
28	PHOH 202	Principles of Occupational and Environmental Health	2 (2-0-4)
29	PHOH 203	Industrial Hygiene	2 (2-0-4)
30	PHOH 204	Principles of Engineering for Occupational Health and Safety	3 (2-2-5)



Academic year / Subject code / Course*			Credits
3rd Year			
31	PHBS 303	Biostatistics	3 (3-0-6)
32	PHEP 306	Principles of Epidemiology and Its Application	3 (3-0-6)
33	PHOH 313	Industrial Process and Hazards	2 (2-0-4)
34	PHOH 317	Industrial Safety	3 (3-0-6)
35	PHOH 325	Safety Engineering and Technology	2 (1-2-3)
36	PHOH 326	Occupational Ergonomics	2 (2-0-4)
37	PHOH 327	Industrial Toxicology	2 (2-0-4)
38	PHOH 328	Occupational Medicine and Health Surveillance	3 (2-2-5)
39	PHOH 329	Occupational Health Psychology	2 (2-0-4)
40	PHOH 330	Risk Assessments in Safety and Health	3 (3-0-6)
41	PHOH 331	Prevention and Control of Fire and Chemical Emergency	3 (2-2-5)
42	PHOH 332	Laws and Ethics in Occupational Health and Safety	3 (3-0-6)
43	PHOH 333	International Standards on Occupational Health and Safety	2 (2-0-4)
44	PHOH 334	Occupational Health and Safety Administrations	2 (2-0-4)
45	PHOH 387	Safety Practice in the Establishments	3 (0-18-3)
4th Year			
46	PHOH 446	Industrial Hygiene Sampling and Analysis	3 (2-2-5)
47	PHOH 447	Industrial Hygiene and Safety Practice	2 (1-2-3)
48	PHOH 462	Occupational Diseases and Prevention	2 (2-0-4)
49	PHOH 463	Industrial Ventilation and Air Pollution Control	3 (3-0-6)
50	PHOH 464	Research & Seminar in Occupational Health and Safety	2 (1-2-3)
51	PHOH 465	Digital Transformation and Innovation in Occupational Health and Safety	2 (1-2-3)
52	PHOH 490	Professional Field Practice and Senior Project	5 (0-30-5)
Elective Courses			
3rd Year			
1	PHOH 335	Current and Emerging Issues in Occupational Health and Safety	2 (2-0-4)
4th Year			
2	PHOH 466	Safety in Logistics and Transportation	2 (1-2-3)
3	PHOH 467	Process Safety Management and Prevention of Major Accidents	2 (1-2-3)
4	PHOH 468	Hazardous Materials and Industrial Waste Managements	2 (2-0-4)



3. Course Description

Year 1

Credits (Lecture–Practice–Self-study)

MUGE 100 General Education for Human Development 3 (3-0-6)

Well-rounded graduates, key issues affecting society and the environment with respect to one's particular context; holistically integrated knowledge to identify the key factors; speaking and writing to target audiences with respect to objectives; being accountable, respecting different opinions, a leader or a member of a team and work as a team to come up with a systematic basic research-based solution or guidelines to manage the key issues; mindful and intellectual assessment of both positive and negative impacts of the key issues in order to happily live with society and nature

LATH 100 Art of Using Thai Language in Communication 3 (2-2-5)

Art of using Thai language and of speaking, listening, reading, writing, and thinking skills for accurate and appropriate communication

LAEN 103 English Level I 3 (2-2-5)

English structure, grammar and vocabulary in the context of daily language use, dealing with integration in listening, speaking, reading, and writing skills; reading strategies, sentence writing, listening for the gist, pronunciation and classroom communication

LAEN 104 English Level II 3 (2-2-5)

Vocabulary, expressions, grammar, and contextualized social language; essential communicative skills in small groups; simulations in various situations; writing practice at a paragraph level; and reading and listening from various sources

LAEN 105 English Level III 3 (2-2-5)

Essential strategies for four language skills: reading and listening from various sources, speaking in everyday use and writing at a paragraph level and short essay, including sub-skills i.e., grammar, pronunciation, and vocabulary; focusing on English in everyday life and in academic reading and issues that enhance students' world knowledge

LAEN 106 English Level IV 3 (2-2-5)

Integrating four English skills by practicing reading news, research articles, commentary, and academic texts, for comprehension and critical thinking, from various sources focusing on the issues that enhance students' world knowledge; listening to news, lecture, and speech via multimedia and the Internet; making conversations in various situations including speaking in public, giving oral presentations and making simulations; and writing essays in various types using citations and references; also practicing sub-skills such as grammar, pronunciation, and vocabulary used in appropriate context



- ITCS 155 Computer Applications** 3 (2-2-5)
Evolution and history of computers. Fundamental concepts of computer systems, Computer main components. Operating systems and the usage, Computer networks and interconnection, Internet and its connecting protocols, Structure of web and its language called HTML, Search engines for Internet, E-mail mechanism and its usage, Internet security, Word processing software, Electronic spreadsheet software, Presentation software
- SCBI 115 Basic of Life** 2 (1-2-3)
Biodiversity; comparative study of reproduction and development in animals; comparative physiology of organ system, receptor and motor system, digestive system, endocrine system, gas exchange and excretory system, circulatory system and immune system and basic biology laboratories
- SCBI 124 General Biology I** 2 (2-0-4)
Basic concepts in biology, carbon and the molecular diversity of life, cell structure and function, energy and metabolism, cellular respiration, photosynthesis, principles of heredity, molecular biology of gene, evolution, population genetics, ecology and conservative biology
- SCCH 102 General Chemistry** 3 (3-0-6)
Atomic structure, chemical bonding, gases, liquids, solids, solutions, colloids, chemical thermodynamics, chemical kinetics, chemical equilibria, ionic equilibria, electrochemistry, the present periodic table
- SCCH 118 Chemistry Laboratory** 1 (0-3-1)
General techniques in chemistry, simple experiment in qualitative and quantitative analysis, some experiments that are related to lectures
- SCCH 129 Basic Organic Chemistry** 3 (3-0-6)
Molecular structure and classification of organic compounds, reactions of organic compounds, nomenclature and stereochemistry, syntheses and reactions of alkanes, cycloalkanes, alkenes, alkynes, aromatic hydrocarbons, halides, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, carboxylic acid derivatives, amines
- SCCH 128 Organic Chemistry Laboratories** 1 (0-3-1)
Crystallization, melting point determination, distillation, extraction and chromatography, stereochemistry using molecular model, solubility classification, hydrocarbons, alcohols and phenols, aldehydes and ketones, carboxylic acids and their derivatives, amine, classification of functional groups
- SCPY 159 Elementary Physics for Health Science** 3 (3-0-6)
Mechanics of motion and equilibrium; work and energy; elastic properties of matters; fluid mechanics and blood circulatory system; temperature heat gas law and respiratory



system, waves and wave properties ears and hearing lights and vision; electricity magnetism electricity in human body; electronics; atoms; nuclei and nuclear medicine

SCPY 110 General Physics Laboratory 1 (0-1-5)

Basic Physics experiments relating to Physics curriculums taught to the first year students in each faculty.

SCMA 162 Calculus and Introduction to Ordinary Differential Equations 3 (3-0-6)

Complex variables, introduction to ordinary differential equations, linear first order differential equation, nonlinear first order differential equations, applications of first order equations, linear second order equations, applications of second order equations, high order linear equations

Year 2

Credits (Lecture–Practice–Self-study)

LAEN 266 English for Health Science 3 (3-0-6)

Study of English terms, sentence structures and expressions used in health science-related professionals; communicative practice in speaking, listening, reading and writing skills

SCBC 203 Basic Biochemistry 3 (3-0-6)

Structures and functions of 4 biomolecules, carbohydrate, lipid, protein and nucleic acid, metabolic processes and regulation of metabolic pathways of 4 biomolecules, flow of genetic information and gene regulation, DNA technology, role of biomolecules in normal physiological systems with some medical applications

SCBC 204 Laboratories Experiments in Basic Biochemistry 1 (0-3-1)

Basic biochemistry laboratory comprise 8 experiments involved in: preparation of acid-base solution and buffering system, using a basic instrument in analysis of biomolecules, determination a physical and chemical properties of all 4 biomolecules and study a metabolic process, that are related to the course Basic Biochemistry (SCBC 203).

SCAN 211 General Human Anatomy 3 (2-3-5)

This course covers the basic concept of living cells, organs and systems of human body. The relationship of human structures and functions is emphasized. The human skeleton and cadavers are utilized in the laboratory study.

SCPS 202 Basic Physiology 3 (2-3-5)

The course covers basic concepts and principles of cell functions and the functions of different organ systems such as nervous, muscular, cardiovascular, respiratory, renal, gastrointestinal tract, endocrine and reproductive systems. It also deals with the mechanisms of regulation of organ system integration and adaptations in order to keep the body in a homeostatic state.



SCMI 203 Basic Microbiology 3 (2-3-5)

Structure, biochemical properties, genetics of microorganism such as bacteria, fungi and viruses roles of microorganism in nature, environment, food and industrial pathogenicity immune response against pathogens immune disorders basic techniques to diagnosis

PHHE 251 Health Education and Health Behavior 2 (2-0-4)

Concepts and principles of health education and health promotion; health related-behavior; analysis of health behaviors and environments based on models of behavioral and social sciences; strategies for changing health-related behaviors and supportive environments

PHOH 202 Principles of Occupational and Environmental Health 2 (2-0-4)

General principles, importance and development of occupational and environmental health at national and international level; hazard anticipation, evaluation and control of environmental hazard; occupational and environmental health risk assessment; problematic issues related to occupational and environmental health; role and responsibility of relevant organizations

PHOH 203 Industrial Hygiene 2 (2-0-4)

Fundamental concepts of industrial hygiene; components of various working environments especially working environments hazardous to workforce in industries; general principles in recognition, evaluation of problems; principles in preventive control of hazards from working

PHOH 204 Principles of Engineering for Occupational Health and Safety 3 (2-2-5)

Basic concepts of various engineering fields: chemical, industrial, mechanic, electric, construction engineering; environmental control of industrial work; control of hazards at the source, path; special technique in control of noise, vibration, dust, light, heat, control of air pollutants in office building, hospitals

Year 3

Credits (Lecture–Practice–Self-study)

PHBS 303 Biostatistics 3 (3-0-6)

The meaning of population and sample, parameter and statistics; measurement of central tendency and dispersion; discrete and continuous probability distribution; sampling distribution; parameter estimation; statistical hypothesis testing concerning means, variance, and proportion; analysis of variance; simple linear regression and correlation

PHEP 306 Principles of Epidemiology and Its Application 3 (3-0-6)

Principles of epidemiology, natural history of disease, principle of disease control, epidemiologic study designs, application of epidemiology in surveillance and outbreak investigation, community diagnosis and prevention and control



PHOH 313 Industrial Process and Hazards 2 (2-0-4)

Concepts of building safe factories, selection of factory location, selection of process and manufacturing process of high-risk industrial plants, type of raw materials, chemicals in production process, problem and potential hazards, prevention control concepts

PHOH 317 Industrial Safety 3 (3-0-6)

Fundamentals of safety at work, causes and nature of accident, incident, evaluation of safety practices, injury records, assessment of frequency and severity of injury, principle of prevention and control of accidents, safety inspection, job safety analysis, safety promotion, personal protective equipment, safety committee, safety program in workplace

PHOH 325 Safety Engineering and Technology 2 (1-2-3)

Engineering techniques in preventive control of accident, incident; prevention of hazardous working condition, production process, machinery, boiler, pressure vessel, electrical system, building, metal welding; maintenance, material handling, especially type of work defined by safety law

PHOH 326 Occupational Ergonomics 2 (2-0-4)

Principles and importance of ergonomics in occupational health; human-machine-environment interaction; anthropometry; occupational biomechanics; manual material handling; work-related musculoskeletal disorders; ergonomics risk assessment tools; work, work station and working system designs; repetitive and shift works; stress, fatigue and psychosocial aspects at work; office ergonomics; innovation and good practices in ergonomics

PHOH 327 Industrial Toxicology 3 (3-0-6)

Principles of occupational toxicology; relationship between dose of toxicants and mechanism of body response to toxicants; properties of hazardous toxicants in industrial setting; prevention of exposure to toxicants such as heavy metals, gases, solvents, carcinogens, and other pollutants

PHOH 328 Occupational Medicine and Health Surveillance 3 (2-2-5)

Occupational medicine concepts in occupational health and safety; causes of occupational diseases and work-related diseases; diagnosis of occupational diseases; prevention of occupational diseases; basic medical care; rehabilitation; health checks based on risk factors; health surveillance; promotion of well-being

PHOH 329 Occupational Health Psychology 2 (2-0-4)

Principles of general psychology, psychological application in industrial sectors, social and environment factor affecting physical, psychological health of workers, depression, burnout syndrome, mental health in workplaces, violence in workplaces, mental health and stress management, prevention and control unsafe work behavior and practice, teaching and training technique, worker's encouragement and good relationships among safety officer, employer and employees



PHOH 330 Risk Assessments in Safety and Health 3 (3-0-6)

Safety protective measure compliance with regulations; production process; activity, location or operational system in industry; hazard identification; risk assessment, severity, review of control measure of existing risks; application principles; safety system in risk management; control and minimization of hazard or risk reduction to international acceptable standards; health risk assessment for the major hazard projects

PHOH 331 Prevention and Control of Fire and Chemical Emergency 3 (2-2-5)

Causes and types of fire in industry, fire prevention and control engineering, fire alarm and fire control system in industry, emergency plan, basic fire-fighting training, techniques, procedure of chemical emergency response, serious accident, organization responsible for emergency response, identification of hazards related to emergency, assessment of situation, response strategy and factors, operational access, safe emergency response, chemical protective clothing and level of protection, personnel and equipment decontamination

PHOH 332 Laws and Ethics in Occupational Health and Safety 3 (3-0-6)

Importance, development, application, enforcement and assessing compliance with the applicable laws; occupational health, safety and environment act; labour protection act; factory act; occupational and environmental diseases control act; public health act; other related acts, ministerial regulations and announcements; occupational health and safety legislations in foreign countries; professional ethics in occupational health and safety

PHOH 333 International Standards on Occupational Health and Safety 2 (2-0-4)

Principle of standardization and relevant organizations; international standards in the form of convention, protocol, recommendation, code of practice on occupational health and safety; management systems on quality, environment, occupational health and safety, business continuity, energy; integrated management systems; standards on risk management, social responsibility; Thai labour standard; technical standards on occupational health and safety; strategies and international collaboration for the development of occupational health and safety toward international standards

PHOH 334 Occupational Health and Safety Administration 2 (2-0-4)

Principles of administration and planning in occupational health, safety and environment; occupational health services in establishments; roles and responsibilities of governmental organizations, private sectors, and related international organizations; occupational health and safety management; economics of safety at work; cost analysis and productivity improvement; loss control management; human resource management; Behavioral Based Safety (BBS); safety leadership



PHOH 387 Safety Practice in the Establishments

3 (0-18-9)

Application of occupational health and safety administration principles, relevant regulations and standards in order to identify occupational safety hazards, prioritize and develop action plan; project planning, project implementation and monitoring, and project evaluation. This safety practice would be held in the factories where machines, equipment and technologies are utilized to enable production/manufacturing processes as well as maintenance and transportation of goods and raw material by applying hazard identification, risk analysis, risk control technique in real situation

Year 4

Credits (Lecture–Practice–Self-study)

PHOH 446 Industrial Hygiene Sampling and Analysis

3 (2-2-5)

Principle and method of working environment evaluation, e.g. heat, cold, light, noise, radiation, pressure, vibration, workplace air pollutants monitoring both personal and area sampling of vapor/gas and particulates, stack sampling, principles of sample analysis, data analysis and interpretation, health risk assessment

PHOH 447 Industrial Hygiene and Safety Practice

2 (1-2-3)

Apply concepts and theory of industrial hygiene, Law, Practice industrial hygiene work in industry, Sampling strategic plan, work plan, walkthrough survey, environmental measurement, evaluation of hazards, data analysis and interpretation, writing report including results and control measure and presentation

PHOH 462 Occupational Diseases and Prevention

2 (2-0-4)

Occupational diseases, work-related diseases, The body's mechanisms of action under harmful occupational conditions, the impacts on physical mental, and social health, prevention and control of occupational diseases and work-related diseases by integrating knowledge of occupational health, health risk assessment, epidemiology, and health surveillance

PHOH 463 Industrial Ventilation and Air Pollution Control

3 (3-0-6)

Ventilation principles in control and prevention of air pollutants, natural ventilation, general ventilation and local exhaust ventilation, ventilation in building, office, design and calculation of general ventilation system, local exhaust ventilation, ventilation system components, hood, duct, fan, cleaning system of air pollutants, ventilation system testing; basic scientific understanding of air pollution, pollutants of concern, their sources and their chemical transformation in the atmosphere, prevention and control of air pollution at sources by management and engineering control

PHOH 464 Research and Seminar in Occupational Health and Safety

2 (1-2-3)

Introductory principles of research methods on occupational health and safety; information searching; discussion of problems in occupational health and safety; integrated approach for problem solving; providing informative opinions; listening to other opinions;



decision making; capability building in careful consideration with knowledge and reasoning; consultation; suggestion provided to others related to occupational health and safety

PHOH 465 Digital Transformation and Innovation in OH&S 2 (1-2-3)

Introduction to digital technology, artificial intelligent (AI), big data management and analytics; disruptive technology; application and transformation of digital technology in industrial activities; risks of cyber treats; issues connecting occupational health and safety; modern safety management and related innovations; practical case studies

PHOH 490 Professional Field Practice and Senior Project 5 (0-30-5)

Practice in establishments to acquire knowledge and increase experience; coordination, working with community and individual problem solving; project handling and project assessment; design and carry out research on an occupational health and safety issue under the supervision of advisor; writing and presentation of results

Elective Courses for Year 3/4

Credits (Lecture–Practice–Self-study)

PHOH 335 Current & Emerging Issues in Occupational Health and Safety 2 (2-0-4)

Current interest and emerging issues on occupational health and safety; specific risks on health, safety and work environment; safety management approaches for highly hazardous activities in industrial, agricultural and service sectors

PHOH 466 Safety in Logistics and Transportation 2 (1-2-3)

Situation and significance of logistics and transportation in industrial activities; causes and consequences of accidents; classification of dangerous goods; packaging, tank and vehicle provisions; marking and labelling; general provisions and participant safety obligation; loading, unloading and handing; transport equipment, vehicle document and instruction; vehicle crew and training; security provisions; vehicle construction and approval

PHOH 467 Process Safety Management and Prevention of Major Accidents 2 (1-2-3)

Global situation on major industrial accidents; importance and necessity of process safety management (PSM); process safety management standards and requirements; planning, implementation, systematic review of progress, corrective actions and continual improvement; examples of management to prevent serious accidents; practical case studies

PHOH 468 Hazardous Materials and Industrial Waste Managements 2 (2-0-4)

Comprehensive knowledge of hazardous chemicals, materials and industrial wastes; categories and classification; relevant laws and regulations; storage; improvement of building characteristics and control measures; additional requirement and safety report; health effects and environmental impact; industrial waste management; waste reduction at source of generation; waste collection and storage, transportation, treatment and safe disposal