

# Health Science (HSCI)

## Courses

### HSCI 1000. College: An Introduction. (1 Hour)

Provides an introduction to the University, college, and health professions to enhance students' understanding of self and the decisions they make academically and socially as members of the University's diverse, multicultural community. Group activities and individual assignments along with active participation in a learning community help students adjust to life on an urban campus, develop a better understanding of the learning process, acquire essential academic skills, and make connections with the faculty and students in the college.

### HSCI 1105. Human Nutrition. (4 Hours)

Examines the fundamental role of nutrition in promoting health and how lifestyle and the socioecological model work together. Covers the physiological functions of energy-providing nutrients in the body and interrelationships, including the key functions of macronutrients and micronutrients. Introduces the use of two different diet assessment tools to assist individuals in selecting food for health promotion. Offers students an opportunity to gain a deeper understanding of what it means to make healthy choices and the role nutrients have on a person's wellness.

**Prerequisite(s):** BIOL 1107 (may be taken concurrently) with a minimum grade of C- or BIOL 1111 (may be taken concurrently) with a minimum grade of C- or BIOL 1115 (may be taken concurrently) with a minimum grade of C- or BIOL 1117 (may be taken concurrently) with a minimum grade of C- or BIOL 1147 (may be taken concurrently) with a minimum grade of C- or BIOL 2217 (may be taken concurrently) with a minimum grade of C- or CHEM 1101 (may be taken concurrently) with a minimum grade of C- or CHEM 1161 (may be taken concurrently) with a minimum grade of C- or CHEM 1211 (may be taken concurrently) with a minimum grade of C- or HSCI 1106 with a minimum grade of C- or PHSC 2301 (may be taken concurrently) with a minimum grade of C- or PHSC 2303 (may be taken concurrently) with a minimum grade of C-

**Attribute(s):** NUpath Natural/Designed World

### HSCI 1106. Contemporary Issues in Nutrition. (4 Hours)

Explores the fundamental role of nutrition in promoting health. Offers an overview of nutrient functions, compositions, and digestion/absorption. Relates concepts covered in class to current topics of interest in nutrition. Offers students an opportunity to discuss their dietary behaviors in relation to the Dietary Guidelines for Americans.

**Attribute(s):** NUpath Natural/Designed World

### HSCI 1990. Elective. (1-4 Hours)

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

### HSCI 2000. Professional Development for Bouvé Co-op. (1 Hour)

Introduces students to the Bouvé Cooperative Education Program and provides them with the opportunity to develop job-search and career-management skills. Offers students an opportunity to perform assessments of their workplace skills, interests, and values and discuss how they impact personal career decisions. Students also have an opportunity to prepare a professional-style résumé, learn proper interviewing techniques, and gain an understanding of the opportunities available to them for co-op. Introduces career paths, choices, and career decision making. Familiarizes students with workplace issues relative to their field of study and teaches them to use myNEUCOOL database in the job-search and referral process. Presents and discusses co-op policies, procedures, and expectations of the Bouvé Cooperative Education Program and co-op employers.

### HSCI 2350. Advanced Nutrition in Health and Disease. (4 Hours)

Designed for health professionals to increase their knowledge and skills in advanced nutrition in health and disease. Builds on a foundation of nutrition and introduces nutrients and their physiological impacts, including the nutritional guidelines for good health and disease prevention. Through case studies, offers students an opportunity to interpret nutrition in the prevention and treatment of diet-related health problems, such as obesity, diabetes, and cardiovascular disease.

**Prerequisite(s):** HSCI 1105 with a minimum grade of C

### HSCI 2500. Public Health Nutrition in the Community. (4 Hours)

Explores the role nutrition plays in promoting and improving health in the community. Examines modern aspects of public health nutrition in the healthcare system by applying the principles of nutrition to design policies, behavior, program planning, food insecurity, marketing, and children and adult nutrition programs. Offers students an opportunity to develop and deliver nutrition education to various populations in the community, including school-age children, college students, and the elderly population.

**Prerequisite(s):** HSCI 1105 with a minimum grade of C

**HSCI 2983. Special Topics. (4 Hours)**

Offers students an opportunity to participate in a small seminar to explore selected topics within the vast subject of healthcare. May be repeated twice.

**HSCI 2990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**HSCI 2991. Research in Health Science. (1-4 Hours)**

Offers an opportunity to conduct introductory-level research or creative endeavors under faculty supervision. May be repeated once.

**HSCI 3990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**HSCI 4700. Health Science Capstone Introduction. (0 Hours)**

Offers students an opportunity to integrate their coursework, knowledge, and experiences into a proposal for a spring semester capstone experience. Students propose their health science culminating experience from options in the form of developing and implementing their own project with faculty mentor support or participating in a faculty-led seminar.

**Prerequisite(s):** PTH 2210 with a minimum grade of C ; (PTH 2300 with a minimum grade of C or PTH 2301 with a minimum grade of C ); (PTH 2350 with a minimum grade of C or PTH 2351 with a minimum grade of C ); PTH 2515 with a minimum grade of C ; (ENGW 3302 with a minimum grade of C or ENGW 3304 with a minimum grade of C or ENGW 3306 with a minimum grade of C or ENGW 3307 with a minimum grade of C or ENGW 3308 with a minimum grade of C or ENGW 3314 with a minimum grade of C or ENGW 3315 with a minimum grade of C )

**HSCI 4720. Health Science Capstone—Service. (4 Hours)**

Offers students an opportunity to integrate their course work, knowledge, and experiences into a project that results in a written report and presentation regarding an issue within the field of health or healthcare. The project is a culminating experience in the health science program. Includes working with a mentor in a field experience in public health education or health policy, public affairs, social service, or other healthcare environment in which the student is qualified. Requires students to present their projects to the seminar class and possibly to the agency or group with which they are working.

**Prerequisite(s):** HSCI 4700 with a minimum grade of S

**Attribute(s):** NUPath Capstone Experience

**HSCI 4730. Health Science Capstone—Research. (4 Hours)**

Offers students an opportunity to integrate their course work, knowledge, and experiences into a project that results in a written report and presentation regarding an issue within the field of health or healthcare. The project is a culminating experience in the health science program. Students may choose to participate in an ongoing research project or create and implement their own research project as their capstone project. Requires students to present their projects to the seminar class and possibly to present a poster at a professional/research expo.

**Prerequisite(s):** HSCI 4700 with a minimum grade of S

**Attribute(s):** NUPath Capstone Experience

**HSCI 4740. Health Science Capstone Seminar. (4 Hours)**

Offers intensive study on the public health approach to a specific, relevant issue. Through a combination of close readings of empirical literature and interactive class discussion, students critique public health approaches and policies regarding the topic of the seminar. Requires students to complete an in-depth study, write a paper, and present their findings on a topic of interest within the larger discussion.

**Attribute(s):** NUPath Capstone Experience

**HSCI 4950. Seminar. (4 Hours)**

Offers students an opportunity for an in-depth study of selected topics within healthcare.

**HSCI 4970. Junior/Senior Honors Project 1. (4 Hours)**

Focuses on in-depth project in which a student conducts research or produces a product related to the student's major field. Combined with Junior/Senior Project 2 or college-defined equivalent for 8 credit honors project. May be repeated without limit.

**HSCI 4971. Junior/Senior Honors Project 2. (4 Hours)**

Focuses on second semester of in-depth project in which a student conducts research or produces a product related to the student's major field. May be repeated without limit.

**Prerequisite(s):** HSCI 4970 with a minimum grade of D-

**Attribute(s):** NUpath Capstone Experience

**HSCI 4983. Topics. (4 Hours)**

Offers students an opportunity to study contemporary issues in healthcare and to expand their breadth of knowledge and engage diverse perspectives.

**HSCI 4990. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**HSCI 4991. Research. (4 Hours)**

Offers an opportunity to conduct research under faculty supervision.

**Attribute(s):** NUpath Integration Experience

**HSCI 4992. Directed Study. (1-4 Hours)**

Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated without limit.

**HSCI 4994. Internship. (4 Hours)**

Offers students an opportunity for internship work. May be repeated without limit.

**Attribute(s):** NUpath Integration Experience

**HSCI 5130. Introduction to Real-World Evidence. (2 Hours)**

Introduces students to the generation of real-world evidence (RWE) from real-world data (RWD) collected through different forms of observational health data. Examines how RWE is used to inform regulators and other stakeholder groups in life sciences and healthcare. Emphasizes the role of team science in executing an RWE analysis.

**HSCI 5140. Foundations of Data Models. (2 Hours)**

Introduces students to design principles behind data modeling in life sciences and healthcare. Examines and compares approaches to common data models across different research communities. Explores the rationale for popular data models through the use of industry case studies.

**HSCI 5150. Methods for Observational Research 1. (3 Hours)**

Surveys approaches to observational research across pharmacoepidemiology, emphasizing approaches used by the Observational Health Data Sciences and Informatics community.

**HSCI 5151. Methods for Observational Research 2. (3 Hours)**

Examines advanced methods in conducting observational research across pharmacoepidemiology, emphasizing approaches used by the Observational Health Data Sciences and Informatics community. Focuses on using open-source software and open-science principles to conduct and interpret a real-world evidence (RWE) study.

**Prerequisite(s):** HSCI 5150 with a minimum grade of B- or HSCI 5150 with a minimum grade of B-

**HSCI 5160. Standardization of Real-World Data. (2 Hours)**

Introduces students to the principles of interoperability protocols in healthcare and life sciences to support clinical data standardization. Explores the process of extract, transform, and load (ETL) in the harmonization of healthcare data. Emphasizes real-world case studies driving current standardization approaches.

**Prerequisite(s):** HSCI 5140 with a minimum grade of B- or HSCI 5140 with a minimum grade of B-

**HSCI 5170. Data Model Transformation. (2 Hours)**

Examines the process for transforming data into a common representation that can be used across research environments. Covers the technical and business processes for data model adoption. Establishes the framework for evaluating data quality and the implementation of agile principles in data model release management.

**Prerequisite(s):** HSCI 5140 with a minimum grade of B- or HSCI 5140 with a minimum grade of B-

**HSCI 5180. Phenotyping. (2 Hours)**

Surveys the process for constructing heuristics to define a population of interest in observational research. Emphasizes the principles of phenotype curation across real-world data feeds and strategies to ensure robust, reproducible research.

**Prerequisite(s):** (HSCI 5130 with a minimum grade of B- or HSCI 5130 with a minimum grade of B- ); (HSCI 5140 with a minimum grade of B- or HSCI 5140 with a minimum grade of B- )

**HSCI 5190. Cohort Building. (2 Hours)**

Examines approaches to defining cohorts in pharmacoepidemiology, emphasizing common analytical tools, knowledge objects, and assessing the appropriateness of clinical heuristics to answer a clinical study question.

**HSCI 6110. Advanced Population Characterization. (2 Hours)**

Introduces students to the design principles of population-level characterization studies at scale, emphasizing the use of common data models and shared analytical approaches to implement reproducible, repeatable research.

**Prerequisite(s):** HSCI 5150 with a minimum grade of B- or HSCI 5150 with a minimum grade of B- or HSCI 5180 with a minimum grade of B- or HSCI 5180 with a minimum grade of B-

**HSCI 6120. Advanced Population Estimation. (3 Hours)**

Introduces students to the design principles of causal inference studies (population-level effect estimation) at scale, emphasizing the use of common data models and shared analytical approaches to implement reproducible, repeatable research. Covers a framework for study diagnostics including empirical equipoise, covariate balance, negative control calibration, empirical null distribution, and power.

**Prerequisite(s):** HSCI 5150 with a minimum grade of B- or HSCI 5150 with a minimum grade of B-

**HSCI 6130. Advanced Patient Prediction. (3 Hours)**

Introduces students to the design principles of patient-level prediction studies at scale, emphasizing the use of common data models and shared analytical approaches to implement reproducible, repeatable research. Covers frameworks for evaluating internal and external validity of machine learning models constructed using real-world data.

**Prerequisite(s):** HSCI 5150 with a minimum grade of B- or HSCI 5150 with a minimum grade of B-

**HSCI 6962. Elective. (1-4 Hours)**

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

**HSCI 6980. Real-World Evidence Capstone. (3 Hours)**

Offers students an opportunity to complete a specialized research or applied capstone project in real-world data strategy and evidence generation as part of the master's degree. Designed to meet the specific learning and research interests of the student to prepare for a career in healthcare and life sciences. Learning experience is based on independently led activities that meet agreed-upon benchmarks with the faculty-mentor. Activities may include working with healthcare, life sciences, regulatory, and/or technology organizations.

**Prerequisite(s):** (HSCI 5151 with a minimum grade of B- or HSCI 5151 with a minimum grade of B- ) or (HSCI 5180 with a minimum grade of B- or HSCI 5180 with a minimum grade of B- ) or (HSCI 5190 with a minimum grade of B- or HSCI 5190 with a minimum grade of B- )