HEALTH SCIENCES PROGRAMS (HSCI)

Explanation of Course Numbers

- Courses in the 1000s are primarily introductory undergraduate courses
- Those in the 2000s to 4000s are upper-division undergraduate courses that can also be taken for graduate credit with permission and additional work
- Those in the 6000s and 8000s are for master’s, doctoral, and professional-level students
- The 6000s are open to advanced undergraduate students with approval of the instructor and the dean or advising office

HSCI 2100. Writing and Composition in the Health Sciences. 3 Credits.
Basic writing mechanics and methods for developing paragraphs and essays; conceptualizing papers, such as crafting outlines and assessing sources; and basics of APA style. Students practice analyzing writing through peer review exercises.

HSCI 2101. Psychosocial Aspects of Health and Illness. 3 Credits.
Comprehensive introduction to the psychological and social aspects of health and wellness. Emphasis on the development of communication skills and the establishment of caring relationships. Discussions of special situations such as working with dying patients and patients with self-destructive behaviors.

HSCI 2102. Pathophysiology. 3 Credits.
Biomedical and scientific framework for the understanding of human disease mechanisms and biologic processes. Overview of infectious, immunologic, cardiovascular, genetic, respiratory, gastrointestinal, neoplastic, reproductive, renal, hematologic, neurologic, and musculoskeletal diseases.

HSCI 2103. Health Policy and the Health Care System. 3 Credits.
Incorporates economic theory and policy analysis methodology to analyze the impact of changes in the health care system on the practice of health sciences professionals and the quality and process of health care. Development of critical thinking skills through review of current medical literature.

HSCI 2104. Management of Health Science Services. 3 Credits.
Application of management and organizational principles to the delivery of services provided by health sciences disciplines. Issues addressed include information systems, leadership, team building, fiscal management, human resources management, quality improvement, and management of conflict and change.

HSCI 2105. Current Issues in Bioethics. 3 Credits.
Basic issues, approaches, and requirements of ethically acceptable decision making with patients, including patient confidentiality, conflicts of interest, allocation of scarce resources, occupational risks in health care, and professional responsibility for overall quality of care.

HSCI 2107. Health Care in Literature. 3 Credits.

HSCI 2108. Quality Improvement/Health Care. 3 Credits.
Analysis of the structures in place to enhance the quality of health care delivery and political and economic influences that affect quality improvement programs. Assessment of specific interventions to enhance health care from the perspectives of providers and patients.

HSCI 2109. Trends and Innovations in Health Care. 3 Credits.
Examination of new technologies, health care delivery models, and the phenomenon of sophisticated consumers. Assessment of the impact of science, technology, ethics, and government on the provision of health care.

HSCI 2110. Disease Prevention and Health Promotion Concepts. 3 Credits.
An overview of basic public health concepts for health sciences students, including epidemiology, health promotion, and disease prevention. Review of current issues in health promotion. Completion of a public health project in a clinical site.

HSCI 2111. Development of the Health Care Professions. 3 Credits.
Students will analyze the history and evolution of health care professions, and compare them to general changes in science and culture. Students will compare and contrast how the evolution of health care professions has changed practice and informed how we may view clinical practice in the future.

HSCI 2112. Writing in the Health Sciences. 3 Credits.
Introduction to the health sciences literature. Emphasis is on construction, evaluation and organization of written communication of health sciences information.

HSCI 2112W. Writing in the Health Sciences. 3 Credits.

HSCI 2113. Informatics in the HSCI. 3 Credits.
Introduction to health care informatics, including management and clinical information systems and their role in administration, clinical, and research arenas in health care.

HSCI 2114. Healthcare/Developing Nations. 3 Credits.
An introduction to health concerns in the developing world. Students will explore interventional approaches for such issues as malaria, HIV/AIDS, clean water, maternal and women’s health, and childhood mortality.
HSCI 2115. Introduction to Biostatistics for Health Sciences. 3 Credits.
Basic concepts of biostatistics with application to the health sciences professions. Research design, frequency distributions, descriptive measures, probability, sampling, regression and correlation, analysis of variance, hypothesis development/testing and data organization/analysis options are covered.

HSCI 2117. Introduction to Statistics for Health Sciences. 3 Credits.
Foundational concepts in descriptive and inferential statistics, including probability, sampling distribution, estimation, correlation, t-Test, simple linear regression, and chi-square. Application of statistical concepts and methods within the health sciences.

HSCI 2130. Primary Care Skills Practicum. 2 Credits.

HSCI 2131. Adult Primary Care Practicum. 2 Credits.
Clinical course on caring for adults with common primary care problems and understanding concepts of health promotion and disease prevention. Students conduct in-depth examinations of specific primary care problems; review current pathophysiology literature; explore pharmacologic and non-pharmacologic treatment modalities; and diagnose and manage acute and chronic problems prominent in ambulatory health clinics serving the general adult population. A minimum of 80 clinical hours is required.

HSCI 2132. Primary Care Mental Hlth Pract. 2 Credits.

HSCI 2133. Specialized Clinic Experience. 2 Credits.

HSCI 2190. Independent Study in Clinical Health Sciences. 1-12 Credits.
Independent study and special projects involving student-defined learning objectives. Permission of the faculty member who will direct the study required prior to enrollment.

HSCI 2195. Special Topics in Health Sci.. 1-3 Credits.

HSCI 3101. General Chemistry I. 4 Credits.
Introduction to physical and inorganic chemistry. Topics include atomic structure, chemical bonding, common types of reactions, stoichiometry, thermochemistry and the properties of gases, liquids, and solids. Didactic lectures augmented by a corresponding hands-on laboratory component.

HSCI 3102. General Chemistry II. 4 Credits.
Continuation of HSCI 3101 General Chemistry I. Topics include kinetics, equilibrium, acid-base chemistry, precipitation reactions, coordination chemistry, thermodynamics, and electrochemistry. Didactic lectures augmented by a corresponding hands-on laboratory component.

HSCI 3103. Organic Chemistry I. 4 Credits.
Introduction to synthetic organic chemistry through exploration of the reactivity and potential biological activity of chemicals with different functional groups. Didactic lectures augmented by a corresponding hands-on laboratory component.

HSCI 3104. Organic Chemistry II. 4 Credits.
Continuation of HSCI 3103 Organic Chemistry I. Reactions combined in a step-wise process, enabling creation of complex and interesting organic molecules. Spectroscopic methods used to determine organic structures; combined with chemical observations, allowing the deduction of structures of increasingly complex substances. Examination of the chemistry of biologically important macromolecules. Didactic lectures augmented by a corresponding hands-on laboratory component.

HSCI 3105. Biochemistry. 3 Credits.
The chemical properties of low molecular weight biochemical molecules, macromolecules and supermolecular complexes essential for life are explained in addition to basic reaction mechanisms and the integration and regulation of biochemical processes. Prerequisites: HSCI 3103 and HSCI 3104.

HSCI 3106. Microbiology for Health Sciences. 3 Credits.
Principles of microbiology with emphasis on microorganisms that impact health and cause human disease. Topics include an overview of microbiology and aspects of medical microbiology, identification and control of pathogens, disease transmission, host resistance, and immunity. Restricted to students who have taken at least one course in biology, or chemistry, or anatomy and physiology, or MLS 2000, or MLS 2001.

HSCI 3107. Introduction to Biochemical Pharmacology. 1 Credit.
The theory of drug action; practical issues that must be addressed when translating knowledge from molecular and cellular research into drug discovery and development. Restricted to students in the post-baccalaureate pre-medicine certificate program. Recommended background: Concurrent enrollment in HSCI 3105.

HSCI 3117. Principles of Biostatistics for Health Sciences. 3 Credits.
Biostatistics for health science professionals. Concepts and methods, including confidence intervals, ANOVA, multiple and logistic regression, and non-parametric analyses. Scientific literature is used to provide a comprehensive context in which analytical evidence is employed to support practices in the health sciences. Prerequisites: HSCI 2117 or permission of the instructor.

HSCI 3201. Biology I. 4 Credits.
Students develop a strong foundation in biological chemistry, cell biology, evolution, and genetics. Didactic lectures are augmented by a corresponding practical laboratory component.

HSCI 3202. Biology II. 4 Credits.
Biological diversity (microbes, protists, invertebrates and vertebrates), animal physiology, and ecology. Didactic lectures are augmented by a corresponding practical laboratory component. Prerequisite: students in the post-baccalaureate certificate in pre-medicine program. Recommended background: completion of HSCI 3201 or an equivalent 4-credit general biology I course.
HSCI 3301. Physics I. 4 Credits.
Classical physics, including mechanics, Newton’s laws of motion, force, gravitation, equilibrium, work and energy, momentum, and rotational motion; periodic motion, waves, and sound; heat and thermodynamics. Didactic lectures augmented by a corresponding hands-on laboratory component.

HSCI 3302. Physics II. 4 Credits.
Continuation of HSCI 3301 Physics I, including electrostatics, electromagnetism, direct and alternating current circuits, and electromagnetic radiation; geometrical and physical optics; special relativity; quantum theory; atomic physics; nuclear physics; particle physics; astrophysics and cosmology. Didactic lectures augmented by a corresponding hands-on laboratory component.

HSCI 4102. Human Physiology/Extreme Environment. 3 Credits.
The course examines human physiology and the pathophysiology of acute illnesses and injuries, and evaluates appropriate mitigation strategies associated with living and working in extreme environments.

HSCI 4103. Health Care Law/Regulation. 3 Credits.

HSCI 4105. Case Studies in Health Care. 3 Credits.

HSCI 4106. Intro to Epidemiology for HS. 3 Credits.
An introduction to epidemiological methods and their applications in the prevention and control of illness, community and clinical interventions, and health services.

HSCI 4112. Research/Writing in Health Sciences. 3 Credits.

HSCI 4112W. Research/Writing in Health Sciences. 3 Credits.

HSCI 4198. Mentored Res. I. 3 Credits.

HSCI 4199. Mentored Res. II. 3 Credits.

HSCI 6213. Advanced Pediatric Health Needs. 3 Credits.
Service delivery to children with disabilities from infancy through early schooling. Emphasis on learning disabilities, ADHD, sensory processing disabilities, and intellectual disabilities with co-occurring developmental and emotional disorders.

HSCI 6233. Pathology-Hlth Sc Students I. 1 Credit.

HSCI 6234. Pathology-Hlth Sc Students II. 3 Credits.
Basic concepts and language of pathology, infectious diseases, and fundamental disease processes. Emphasis on pathogenesis and dynamics of disease. Causation, evolution, and morphology of pathological changes in the principal diseases of each organ system.

HSCI 6240. Issues and Trends in the Health Care System. 3 Credits.
Analysis of key contemporary issues in U.S. health and social policy that affect the design and structure of the health care system. The health policy process and initiatives that shape care delivery.

HSCI 6241. The Health Care Enterprise. 3 Credits.
An overview of global business principles related to health care systems: the management of patient-centered care delivery, marketing, finance and fiscal management principles, information technology, and quality improvement.

HSCI 6261. Foundations in Clinical and Translational Research. 3 Credits.
Overview and analysis of the translational research principles and practice through the application of basic, clinical, community health and health services research concepts.

HSCI 6262. Transdisciplinary Seminar/Practicum. 3 Credits.
Transdisciplinary analysis of key translational research concepts delivered in a practicum and workshop framework. Individualized experiential practicum to address educational and experiential gaps.

HSCI 6263. Biostatistics in Translational Research. 3 Credits.
Basic concepts and methods of biostatistics applied to translational research. Topics include distributions, populations and sample selection, variables, interaction and confounding, hypothesis formulation, correlation, t-tests, ANOVA, regression, and chi.

HSCI 6264. Epidemiology Translational Research. 3 Credits.
Basic concepts and methods of epidemiology and their application in measuring, studying and improving the health of populations applied to applications for translational research.

HSCI 6265. Grantsmanship in Translational Research. 3 Credits.
Writing grant proposals to fund clinical research, with an emphasis on translational research proposals. Emphasis is on persuasive communication, conceptually based hypotheses and research methods and the grant application process, including communicating.
HSCI 6270. Resear Meth Hlth Prof I. 3 Credits.
Methodological issues of basic, applied, and clinical research. Students develop the knowledge and skills to critically appraise and synthesize research results, analyze qualitative and quantitative data, evaluate evidence-based methods, develop research questions, and identify appropriate inquiry methodologies. Students become familiar with all elements of a research proposal, including those relating to the use of human subjects and informed consent.

HSCI 6271. Rsch Meth Hlth Prof II. 3 Credits.
Methodological issues of basic, applied, and clinical research. Students develop the knowledge and skills to critically appraise and synthesize research results, analyze qualitative and quantitative data, evaluate evidence-based methods, develop research questions, and identify appropriate inquiry methodologies. Students become familiar with all elements of a research proposal, including those relating to the use of human subjects and informed consent.

HSCI 6273. Bioinformatics for Genomics. 3 Credits.
The bioinformatics tools for different analytical situations. Strengths and limitations of the most common bioinformatics strategies. Principally limited to analysis of genomic data, the course is planned to enable students to generalize the acquired knowledge and its underlying principles and techniques to other types of ‘big data’ applications for the purpose of interpretation of results.

HSCI 6275. Transdisciplinary Research Proposals. 3 Credits.
The integration of competencies acquired throughout the program. The development and submission of a transdisciplinary research proposal that responds to a Call for Proposals from an external sponsor, such as the National Institutes of Health.

HSCI 6285. Principles of Collaboration and Team Science. 3 Credits.
Approaching health, technology, social, and environmental problems with cross-disciplinary engagement and collaboration. Foundational and practical principles and their impact on collaborative and team science engagements. Restricted to PhD candidates in translational health sciences; permission of the instructor may be substituted.

HSCI 6287. Biology of HIV/AIDS. 3 Credits.
The basic science, pathogenesis, natural history, and laboratory identification of the human immunodeficiency virus.

HSCI 6291. Advncd Topics/Health Sciences. 1-3 Credits.
Topics vary depending on current issues of interest and faculty availability. Open to undergraduates with permission of the instructor.

HSCI 6297. Indpendnt Study/Health Profess. 1-5 Credits.
Independent study involving analysis of a clinical topic, a patient education project, or an on-site mentored clinical research practicum.