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 1101. Careers in Health Care. 1 Credit.
Introduction to health professions and an orientation to the U.S. health care system; training and educational pathways required for various health professions.

HSCI 1102. Medical Terminology I. 3 Credits.
First in a two-course series introducing medical vocabulary and terms related to the anatomy, physiology, pathology, and treatment of select systems; the gastrointestinal, respiratory, cardiovascular, blood, lymphatic, integumentary, skeletal, and muscular systems. Recommended background: Prior completion of a course in biology.

HSCI 1103. Medical Terminology II. 3 Credits.
Second in a two-course series covering medical vocabulary and terms related to the anatomy, physiology, pathology, and treatment of select systems; the nervous, urinary, reproductive, endocrine, ophthalmic, and otolaryngologic systems. Prerequisite: HSCI 1102. Recommended background: prior completion of a course in biology.

HSCI 1106. Introduction to Biotechnology for Health Sciences. 3 Credits.
Concepts in biotechnology with special emphasis on issues and advances in medicine and health care. Restricted to Students in SMHS.

HSCI 1107. Introduction to Sterile Processing. 3 Credits.
Concepts and terminology in perioperative care; basic surgical instrumentation, inventory control, and sterile processing standards. Restricted to SMHS students. Prerequisites: HSCI 1101, HSCI 1102 and HSCI 1103.

HSCI 1108. Introduction to Food and Nutrition. 3 Credits.
Introduction to food and nutrition and their impact on health and wellness; nutrients and metabolism, dietary and food practices, obesity, nutrient requirements across the lifespan, access to proper nutrition, and commercial messages in nutrition and advertising. Prerequisites: HSCI 1102 and HSCI 1103.

HSCI 1109. Introduction to Surgical Sciences. 3 Credits.
Introduction to surgical technology; terminology, sterilization processes, surgical instrumentation, techniques, and basic case management. Restricted to SMHS students. Prerequisites: HSCI 1102 and HSCI 1103.

HSCI 1110. Concepts of Pathophysiology and Health. 3 Credits.
Introduction to concepts of pathophysiology and health with special emphasis on issues and advances in nursing and health care. Restricted to students in the Health Sciences program. Prerequisites: HSCI 1102 and HSCI 1103.

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.
The evolution of the health care professions; basic information pertinent to all aspects of the support and delivery of health care services; and legal and professional considerations related to health occupations.

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. Health Care in Developing Nations. 3 Credits.
An introduction to health concerns in the developing world. Students explore interventional approaches for such issues as malaria, HIV/AIDS, clean water, maternal and women’s health, and childhood mortality.

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 2118. Global Women’s Health. 1 Credit.
The social, cultural, and economic conditions affecting health outcomes for women and girls across the globe. Through a human rights lens, students explore the core women’s health issues outlined by the World Health Organization (WHO).

HSCI 2120. Primary Care Skills Practicum. 2 Credits.
HSCI 2130. Primary Care Skills 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 Health Practicum. 2 Credits.

HSCI 2133. Specialized Clinical 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 directing the study is required prior to enrollment.

HSCI 2195. Special Topics in Health Sciences. 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 3108. Microbiology for Health Sciences Laboratory. 3 Credits.
Practical study of bacteria, yeasts, molds, protozoa, and viruses in relation to the health professions; handling pathogenic specimens, using the microscope, and culturing microbes to identify and quantify pathologic and non-pathologic organisms encountered in human specimens; sterile technique, disinfection, and staining methodologies. Laboratory fee. Prerequisites: BISC 1115 and BISC 1116. Recommended background: Completion of 3 credits in microbiology lecture or concurrent registration in HSCI 3106.

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 in Extreme Environments. 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. Introduction to Epidemiology for Health Sciences. 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 and Writing in Health Sciences. 3 Credits.

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

HSCI 4198. Mentored Research I. 3 Credits.

HSCI 4199. Mentored Research II. 3 Credits.

HSCI 6212. Teaching Strategies in the Health Professions. 3 Credits.
Application of teaching and learning principles in the design of education in health professions. Illustrates teaching and learning practices grounded in andragogy, contributing to curriculum program development and the enhancement of teaching and assessment skills.
HSCI 6213. Curriculum Development in the Health Professions. 3 Credits.
Curriculum development and assessment skills in the health professions. Variables that affect the manner in which individuals learn and interact within professions and organizations.

HSCI 6223. Topics in Health Care Leadership. 3 Credits.
Theories and styles of leadership, including organizational management and values, strategic planning, communication strategies, managing change, and negotiating conflict in the context of the health care delivery system.

HSCI 6231. 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 Sci Students I. 1 Credit.

HSCI 6234. Pathology-Hlth Sci 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 Sem/Pract.. 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 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 ch.

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. Research Methods for the Health Professions 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. Research Methods for the Health Professions 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. Advanced Topics in 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. Independent Study for Health Professionals. 1-5 Credits.
Independent study involving analysis of a clinical topic, a patient education project, or an on-site mentored clinical research practicum.

HSCI 8212. Teaching Strategies in the Health Professions. 3 Credits.
Application of teaching and learning principles in the delivery of education in health professions; practices grounded in andragogy, contributing to curriculum program development and the enhancement of teaching and assessment skills. Restricted to SMHS students. Recommended background: experience in health care or practice as a health care professional.

HSCI 8213. Curriculum Development in the Health Professions. 3 Credits.
Curriculum development and assessment skills in medical and health science settings. Restricted to SMHS students. Recommended background: experience in health care or practice as a health care professional.