Health Science (HAV, HAN)
Major in Health Science

School of Health Technology and Management

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Minors or second majors of particular interest to students majoring in Health Science: Biology (BIO), Business Management (BUS), Chemistry (CHE), Economics (ECO), Computer Science (CSE), Environmental Studies (ENS), Health and Wellness (LHW), Psychology (PSY), Sociology (SOC)

Health Science (HAV, HAN)
The School of Health Technology and Management (SHTM) offers a Bachelor of Science degree in Health Science (BSHS), with clinical and non-clinical concentrations. Non-clinical concentrations of study include community health education, human development and disability studies, emergency and critical care, environmental health and safety, health care informatics, health care management, healthcare quality; coding and reimbursement, and public health. Clinical concentrations of study include anesthesia technology, medical dosimetry, nuclear medicine technology, and radiologic technology.

HAV/HAN
The Health Science major requires that students receive a broad liberal arts education during their first three years (HAV). Students can declare Health Science as a major at any time. In the senior year (HAN), the curriculum focuses on health care related topics. Graduates will be knowledgeable about health care, and can expect to be employed by hospitals; integrated health care delivery systems; physician group practices; health departments; nursing homes; and managed care, corporate and not-for-profit organizations. They can also pursue clinical and graduate degrees through appropriate admissions processes.

Requirements for the Major in Health Sciences (HAN)

While there is no formal application process, all students must complete the following requirements before advancing to the senior year curriculum. Note: the following requirements must be completed by the end of the spring semester prior to advancing to the fall senior year curriculum.

Health Science, first three years (HAV)
1. Completion of 91 credits with a minimum g.p.a. of 2.00 or higher
2. Completion of the Diversified Education Curriculum
3. Completion of a minimum of 16 credits in the natural sciences with a grade of C or higher. Note: HAN 200 and HAN 202 (or equivalent anatomy and physiology courses) are required natural sciences courses
4. Completion of 21 credits in related electives courses with a grade of C or higher. (see listing below)
   Note: Any natural science course taken beyond the minimum requirement of 16 credits can also satisfy related elective requirement.
   Note: HAN 312 and HAN 251 (effective 2015) are required related elective courses.
5. Completion of 10 credits at the upper-division level (courses numbered 300 or higher), including courses used to satisfy Requirements 1 through 5 above.
6. Completion of second major or minor is required prior to advancing to HAN senior courses.
   Note: 10 credits of computer science/information systems electives are strongly recommended as prerequisites for the Health Care Informatics concentration. CSE 110, CSE 114, and CSE 215 are strongly recommended.
   For more information, please visit http://healthtechnology.stonybrookmedicine.edu/programs/hs

Requirements for the Major

Core Courses
To be completed during the first semester, senior year. Students must enroll in 15 credits of core health science courses including:
Courses in the Concentration
To be completed during the second semester, senior year. Students are advised to select an area of concentration because it will offer greater career opportunities.

A. Health Care Management
This concentration provides the knowledge and skills to manage health care practices, plan health care programs, and utilize the fundamentals of health care management and health services administration.

1. HAN 432 Introduction to Health Care Management  
2. HAN 434 Corporate Compliance and Regulation  
3. HAN 435 Sales and Marketing in Health Care  
4. HAN 436 Continuous Quality Improvement in Health Care

B. Community Health Education
This concentration provides students with the knowledge and skills needed to plan, implement, and evaluate health education programs in the community. Employment opportunities include public and private health-related agencies, hospitals, and HMOs.

1. HAN 440 Introduction to Community Health Education  
2. HAN 442 Community Health Education Models and Resources  
3. HAN 444 Teaching Strategies  
4. HAN 456 Behavioral and Social Aspects of Health

C. Public Health
This concentration provides students with a basic foundation, including epidemiology and biostatistics, in public health. Students who graduate with this concentration may find employment in health departments, public health agencies, health maintenance organizations and health-related corporations.

1. HAN 450 Introduction to Public Health  
2. HAN 452 Epidemiology and Biostatistics  
3. HAN 454 Issues in Public Health  
4. HAN 456 Behavioral and Social Aspects of Health

D. Health Care Informatics
This concentration prepares the student for a career in health care information systems, and processing and managing health care data with computer and communication technologies. Emphasis is placed on health care information systems' architecture, computerized medical data processing, and clinical decision support systems.

1. HAN 462 Developing Health Information Systems  
2. HAN 464 Health Information Systems Management  
3. HAN 466 Applied Healthcare Informatics  
4. HAN 467 Utilization and Outcomes Research Methods

E. Environmental Health and Safety
This concentration explores the concepts and principles of various environmental health issues, including lead management, pest management, hazardous waste management, and food service sanitation. Emphasis is placed on the recognition, identification, and control of environmental contaminants in the workplace; prevention and preparedness for hazardous material incidents; and compliance with various regulatory agencies.

1. HAN 470 Occupational Health and Safety Engineering  
2. HAN 474 Industrial Hygiene  
3. HAN 475 Fundamentals of Environmental Health  
4. HAN 476 Hazardous Materials, Emergency Response, and Environmental Auditing  
5. HAN 478 Internship in Environmental Health

F. Emergency and Critical Care
This concentration will serve the needs of those students interested in pursuing clinical graduate studies. Emphasis is placed on providing knowledge of the most frequently encountered medical emergencies, including trauma and resuscitation. In addition, due to the changing global environment, courses on hazardous materials and weapons of mass destruction will also be provided.

1. HAN 416 Special Issues in Emergency Care and Resuscitation  
2. HAN 417 Cardiac Emergencies  
3. HAN 471 Trauma and Trauma Systems  
4. HAN 472 Emergency Response to Hazardous Materials and Terrorism
5. HAN 477 Medical Emergencies

G. Disability Studies and Human Development
This concentration provides an interdisciplinary focus of study in areas such as independent living, employment, adults and children with disabilities, and health and community issues. Job opportunities for entry-level professional and managerial positions may be found in developmental or physical disability services agencies, independent living centers, mental health centers, the geriatrics and vocational rehabilitation agencies.

1. HAN 443 Aging and Disability
2. HAN 446 Disability Health and Community
3. HAN 447 Children with Disabilities
4. HAN 448 Disability and Employment
5. HAN 449 Project in Disability Studies

H. Medical Dosimetry
A medical dosimetrist is a member of the radiation oncology team. Medical dosimetrists have the education and expertise necessary to generate radiation dose distributions and dose calculations for cancer patients in collaboration with the medical physicist and the radiation oncologist. After completion of this concentration, students continue on to the post-baccalaureate program in order to be eligible to take the Medical Dosimetrist Certification exam. Job opportunities may be found in cancer treatment centers, community hospitals, free-standing clinics and medical schools. (total length of program 4 + 1 = 5 years) Note: HAN 395 Radiation Physics in Medicine (4 credits) is required during the fall semester of the senior year as a prerequisite to acceptance into the concentration. Acceptance into the post-baccalaureate clinical year is required in order to enter the concentration.

The Medical Dosimetry program is accredited by the:

Joint Review Committee on Education in Radiologic Technology
20 North Wacker Drive, Suite 2850 Chicago, Illinois 60606-3182
Phone: 312.704.5300
Email: mail@jrcert.org

1. HAN 402 Radiographic Anatomy and Pathology
2. HAN 482 Introduction to Pathology
3. HAN 486 Principles and Practices of Radiation Therapy
4. HAN 487 Introduction to Treatment Planning
5. HAN 490 Fundamentals of Medical Dosimetry and Contouring
6. HAN 492 Radiation Oncology/Medical Physics II

For admission requirements to the clinical concentrations, please refer to the SHTM Web site at http://healthtechnology.stonybrookmedicine.edu/programs/hs

I. Nuclear Medicine Technology
This concentration was designed to educate students to meet a growing need for highly trained technologists who utilize rapidly developing technologies to image the distribution of radioactive agents in the body. Nuclear medicine is widely used for imaging bodies of patients with cardiac conditions and those with cancer. After completion of this concentration, students continue on to the post-baccalaureate program in order to be eligible to take the national registry examination. Job opportunities may be found in hospitals, physicians’ offices and diagnostic laboratories. (total length of program 4 + 1 = 5 years)

Note: HAN 395 Radiation Physics in Medicine (4 credits) is required during the fall semester of the senior year as a prerequisite to acceptance into the concentration. Acceptance into the post-baccalaureate clinical year is required in order to enter the concentration. Students must complete the one-year post-baccalaureate clinical training in order to be eligible to take the National Registry Examination.

1. HAN 401 Radiobiology and Health Physics
2. HAN 402 Radiographic Anatomy and Pathology
3. HAN 426 Nuclear Medicine Instrumentation
4. HAN 427 Nuclear Medicine Procedures
5. HAN 429 Radiopharmacy and Therapy

For admission requirements to the clinical concentrations, please refer to the SHTM Web site at http://healthtechnology.stonybrookmedicine.edu/programs/hs

J. Radiologic Technology
This concentration was developed to train students to meet the growing demand for technologists who image the body through the use of radiation equipment (X-ray technology). As a member of the radiological team, technologists capture images of bones, organs, and blood vessels as prescribed by physicians to assist in the diagnosis of diseases or injuries. After completion of this concentration, students continue on to the post-baccalaureate program in order to be eligible to take the national registry examination. Job opportunities may be found in hospitals, physicians’ offices, urgent care clinics, diagnostic laboratories and industry. (total length of program 4 + 1 = 5 years)

Note: HAN395 Radiation Physics in Medicine (4 credits) is required during the fall semester of the senior year as a prerequisite to acceptance into the concentration. Acceptance into the post-baccalaureate clinical year is required in order to enter the concentration. Students must complete the one-year post-baccalaureate clinical training in order to be eligible to take the National Registry Examination.

Stony Brook University: www.stonybrook.edu/ugbulletin
1. HAN 401 Radiobiology and Health Physics
2. HAN 402 Radiographic Anatomy and Pathology
3. HAN 404 Radiology Instrumentation
4. HAN 405 Radiographic Technique
5. HAN 406 Radiographic Procedures and Positioning I

For admission requirements to the clinical concentrations, please refer to the SHTM Web site at http://healthtechnology.stonybrookmedicine.edu/programs/hs

K. Anesthesia Technology
This concentration allows students to function as an integral member of an anesthesia team in a surgical setting. After completion of this concentration, students can work as an assistant in the operating room and can continue on to the post-baccalaureate program in order to be eligible for the national certification examination. (total length of program 4 + 1 = 5 years)

1. HAN 434 Corporate Compliance and Regulation
2. HAN 481 Intro. to Anesthesia
3. HAN 483 Cardiopulmonary Physiology for Anesthesia Technology
4. HAN 485 Clinical Monitoring
5. HAN 489 Pharmacology for Anesthesia Technology

For admission requirements to the clinical concentrations, please refer to the SHTM Web site at http://healthtechnology.stonybrookmedicine.edu/programs/hs

L. Healthcare Quality: Coding and Reimbursement
This concentration is designed to prepare students for entry level practice as a medical biller and coder. Medical billers and coders are specialized technicians who consult classification manuals to help determine the proper billing codes and utilize computer software to assign one of several hundred “diagnosis-related groups,” or DRGs. The DRG determines the amount for which the hospital will be reimbursed if the patient is covered by Medicare or other insurance programs using the DRG system. In addition to the DRG system, coders use other coding systems, such as those geared toward ambulatory settings or long-term care.

Acceptance into this concentration is required prior to enrollment. For admission requirements to this concentration, please refer to the SHTM website at http://healthtechnology.stonybrookmedicine.edu/programs/hs

Note: In addition to the spring semester concentration coursework this concentration requires a 6 credit, full-time 6 week practicum during summer session

1. HAN 420 ICD-10-CM and ICD-10-PCS for Coders
2. HAN 421 Outpatient Coding
3. HAN 422 Healthcare Reimbursement
4. HAN 424 Pathophysiology for Healthcare Professionals
5. HAN 489 Pharmacology for Anesthesia Technology
6. HAN 423 Coding Practicum

Related Electives
Students are encouraged to take related electives designated:
• ECO, CSE and BUS for the Health Care Management concentration
• CSE, PSY, ECO and BUS for the Health Care Informatics concentration
• HIS, HBP, ECO, MEC, BCP, SOC and BUS for the Environmental Health concentration
• LHW, ECO, ANT, SOC, HMC, PSY and BUS for the Public Health concentration
• SOC, HWC, LHW, PSY, SSI and HMC for the Community Health Education concentration

Relevant electives are subject to change. Please visit the SHTM website http://healthtechnology.stonybrookmedicine.edu/programs/hs for more information.
HAN

Health Sciences

HAN 200: Human Anatomy and Physiology for Health Science I
This is the first course in a two-part sequence that introduces the study of human anatomy and physiology at the cellular, tissue, and organ level. Emphasizes understanding disease processes associated with systems. Laboratory sessions include virtual on-line exercises designed to illustrate principles learned and computer simulations in physiology and anatomy dissection. (P/NC grade option is not available.) Open to non-HSC students.
Prerequisite: one BIO course
4 credits

HAN 202: Human Anatomy and Physiology for Health Science II
This is the second course in a two-part sequence that continues the study of human anatomy and physiology. Topics include the endocrine system, cardiovascular system, the immune system, the respiratory system, the digestive system, nutrition, the urinary system, the reproductive system, fluid, electrolyte, acid-base balance and heredity. Laboratory sessions entail virtual on-line exercises designed to illustrate principles learned and computer simulations in physiology and anatomy dissection. (P/NC grade option is not available) Open to non-HSC students.
Prerequisite: HAN 200
4 credits

HAN 300: Health Care Issues
Provides students with an overview of the organization of the health care delivery system. Includes the role of health care professionals and health care organizations. Explores issues regarding health care insurance, the uninsured and underserved, managed care and changes in the health care marketplace. Provides an overview of major diseases including epidemics, chronic and acute illness. Discusses the role of health promotion and disease prevention as well as alternative and complementary medicine. Restricted to HAN majors.
Prerequisite: Admission to Undergraduate Health Sciences Center program
3 credits

HAN 312: Human Anatomy, Health and Medical Language
Develops a deeper knowledge of human anatomy and a working medical vocabulary that applies to clinical scenarios. Builds on a foundation of anatomy and physiology. Emphasizes the interrelationships among human anatomy, body systems, pathophysiology and clinical medicine. Introduces the medical professionals and the technology utilized to diagnose and treat patients. (P/NC grade option is not available.) Open to non-HSC students.
Prerequisite: HAN 200 Corequisite: HAN 202
3 credits

HAN 333: Communication Skills
Introduces the principles of effective communication and stages of group development. Offers theory and practice of interpersonal communication and groups. Provides specific topics related to health care teams. Restricted to HAN majors.
Prerequisite: Admission to Undergraduate Health Sciences Center program
3 credits

HAN 335: Professional Ethics
Provides students with a framework for identifying ethical dilemmas in professional settings. Through the use of case studies and role-playing, students simulate ethical situations relating to confidentiality, informed consent and truth-telling, and explore various approaches for resolving these conflicts. Presents professional codes of ethics using small and large group discussions. Presents and discusses ethics-related topics such as genetics, transplants, cloning, advance directives, and health care accessibility. Restricted to HAN majors.
Prerequisite: Admission to Undergraduate Health Sciences Center program
3 credits

HAN 364: Issues in Health Care Informatics
Acquaints students with the use and application of personal computers and medical information systems used in health care. Emphasizes the optimization and customization potential of computer functions for standard and specialized tasks. Examines the present and potential use of the Internet in the health care arena. Presents the application of medical informatics to health care delivery through classroom demonstrations and discussions. Restricted to HAN majors.
Prerequisite: Admission to Undergraduate Health Sciences Center program
3 credits

HAN 383: Professional Writing
Comprehensive overview of the skill set required to write professional documents. Students will be required to communicate to a variety of audiences via letters, memos, electronically transmitted documents, grant proposals, researched essays, and brochures. Introduces students to software packages and other web-based resources. Restricted to HAN majors.
Prerequisite: Admission to Undergraduate Health Sciences Center program
3 credits

HAN 395: Radiation Physics in Medicine
Introduces an introduction to radiological and radiation oncology physics for students interested in a career in either medical imaging or radiation therapy/oncology. Presents elements of mathematics and general physics relevant to the radiological sciences. Topics include production of radiation, radioactivity, interaction of radiations with matter, radiation detection, characteristics of high energy medical LINAC radiation, absorbed dose calculation and measurement, radiography, radionuclide imaging, imaging with ultrasound, imaging with magnetic resonance, and basic medical radiation safety. Restricted to HANBS students.
Prerequisite: Admission to Undergraduate Health Sciences Center program
3 credits

HAN 401: Radiobiology and Health Physics
Presents an overview of the biological effects of radiation by examining the interaction of radiation with matter, macromolecules, cells, tissue and the whole body. Studies the clinical impact of responses to radiation. Introduces students to radiation safety through topics such as biologic consequences of irradiation, regulatory limitation of exposure, methods for exposure minimization, and radiation monitoring. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394
Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 402: Radiographic Anatomy and Pathology
Provides basic radiographic anatomy from both the projection and cross sectional point of view. Introduces to basic disease processes, including the nature and causes of disease and injury. Examines these processes on medical images acquired through radiography, computed tomography, angiography, magnetic...
resonance, scintigraphy, emission computed tomography and ultrasonography. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394

HAN 404: Radiology Instrumentation
Expands imaging physics into the area of Radiologic Technology. Studies the physical basis, construction, operation, and quality control of radiographic, fluoroscopic, computed radiographic, direct radiographic, digital subtraction, and computed tomography systems. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394

HAN 405: Radiographic Technique
Focuses on production of radiographic image. Includes rationale for selection of technical factors, issues of image resolution and contrast, image receptor technology; film sensitometry; image intensification; film processing; grids; automatic exposure control; portable/surgical procedures; and basic contrast agent pharmacology, and administration directly related to the production of radiographic images. Presents an overview of the special modalities of computed radiography (CR), direct radiography (DR), fluoroscopy, digital fluoroscopy, digital subtraction angiography (DSA), computed tomography (CT), and picture archive communication systems (PACS). Special emphasis is placed on reducing patient exposure to radiation. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394

HAN 406: Radiologic Procedures and Positioning I
Examines routine clinical radiographic positioning of the upper and lower extremities, shoulder, spine, chest, pelvis, skull, abdomen, and digestive and urinary systems. Includes portable studies, operating room applications, angiography and advanced imaging techniques. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394

HAN 416: Special Issues in Emergency Care and Resuscitation
Explores issues in special patient populations and areas in emergency care. Covers pediatric emergencies, obstetric emergencies, neonatology, and geriatric emergencies. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes

HAN 417: Cardiac Emergencies
Exposes students to concepts and issues critical to assessment and care of patients presenting with cardiac emergencies. Covers cardiovascular pathophysiology; cardiac patient assessment and management; cardiac electrophysiology; cardiopulmonary resuscitation; and advanced cardiac life support. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes

HAN 420: ICD-10-CM and ICD-10-PCS for Coders
Comprehensive overview of the practice and procedure of International Classification of Diseases, 10th Revision, Clinical Modification, Procedural Coding System, (ICD-10-CM and ICD-10-PCS) guidelines for coding and reporting in the hospital and physician’s office. Topics include: accurately translating infectious, parasitic, body systems disease; physical and mental disorders, and procedures Uniform Hospital Discharge Data Set (UHDDS) definitions and ICD-10-CM-PCS codes to hospital records, identification of patient encounter types, and interpretation of health/medical records. Course will also cover supplementary classification such as V-Z codes. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes

HAN 421: Outpatient Coding
Comprehensive overview of the practice and procedures of the Current Procedural Terminology (CPT-4) code set. Includes interpreting conventions; formats and instructional notations; definitions of the classification system and CPT nomenclature. Applies basic guidelines from medical, surgical, evaluation/management, and diagnostic services to select medical procedures and services that require coding in the hospital and physician office. Restricted to students approved for appropriate senior year track in the Health Science major.

HAN 422: Healthcare Reimbursement
Introduces the basics of healthcare reimbursement. Includes commercial, managed care and federal insurance plans and how reimbursement systems affect providers, payers and consumers. Emphasizes the prospective payment system, uniform hospital discharge data set, and utilizing inpatient coding knowledge to understand payment methodologies in acute care settings. Incorporates current reimbursement and payment issues mandated by the affordable care act, including accountable care organizations, value-based purchasing and recent PPS rules and regulations. Restricted to students approved for appropriate senior year track in the Health Science major.

HAN 424: Pathophysiology for Healthcare Professionals
Provides broad but significant immersion in pathophysiology to develop an understanding of common conditions treated in the inpatient and ambulatory settings. Emphasizes a systems based approach to disease states. Highlights the pathophysiology, clinical presentation, diagnostic evaluation, and pharmacologic treatment and monitoring of the common diseases within each body system that coders encounter in the medical record. Restricted to students approved for appropriate senior year track in the Health Science major.
HAN 426: Instrumentation for Nuclear Medicine Technology
Expands on HAN 394 (Imaging Physics), specifically in the area of Nuclear Medicine Technology. Examines the physical basis, construction, operation and quality control of radiation detection, pulse height analysis, planar imaging, Single Photon Emission Tomography (SPECT) imaging and Positron Emission Tomography (PET) imaging devices. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394
Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 427: Nuclear Medicine Procedures
Covers principles, methods and instrumentation used in Nuclear Medicine imaging. Examines the preparation and performance of planar, Single Photon Emission Tomography (SPECT) and Positron Emission Tomography (PET) nuclear medicine imaging procedures. Provides information needed to perform a variety of imaging and/or functional studies (e.g. liver, spleen, hepatobiliary, gastric reflux, gastrointestinal bleeds, lung, endocrine, central nervous system). Presents in vitro nuclear medicine procedures. Principles of sensitivity, specificity, accuracy, and predictive values of diagnostic testing are also examined. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394
Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 429: Radiopharmacy and Therapy in Nuclear Medicine
Examines the production, labeling, quality control, clinical biodistribution, and application of radionuclide tracers for nuclear medicine imaging. Covers radionuclide and radiopharmaceutical characteristics that provide suitable imaging properties. Discusses various aspects of laboratory procedures (e.g. safe handling of radionuclides, radiation safety surveys, hot laboratory instruments, radiopharmaceutical preparation, quality control and sterile technique). Explores pathologies, radiopharmaceuticals, dosage calculation and administration, and patient management issues related to radionuclide therapy. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: HAN 394
Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 432: Introduction to Health Care Management
Introduces students to the practices and theories of health care policy and management. Presents an overview of the trends in public policy and management techniques. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 434: Corporate Compliance and Regulation
Provides an overview of recently enacted legislation requiring health care institutions' compliance programs. Introduces regulations and compliance including anti-trust, controlled substances, Americans with Disabilities Act, Occupational Safety and Health Act, Joint Commission on Accreditation of Health Care Organizations, Department of Health jurisdiction over hospitals and licensure requirements. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes
4 credits

HAN 435: Sales and Marketing in Health Care
Introduces the essential aspects of marketing and sales in the changing health care world. Addresses the concept of marketing, the nature of marketing strategy and the environment in which marketing operates. Provides a framework for understanding the consumer, along with key selling methods. Topics include the "Four Ps" of marketing, promotional elements of marketing, the communication process, and personal selling. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 436: Continuous Quality Improvement in Health Care
Provides basic principles associated with Total Quality Management (TQM) and Continuous Quality Improvement (CQI). Aids identification and quality problem-solving found in all health care organizations utilizing CQI tools and techniques. Through the use of case studies, current events, and textbook materials, students will learn how to identify problems, recommend improvements, and collect data to demonstrate process improvement. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 440: Introduction to Community Health Education
Introduces students to the foundation of planning, implementing and evaluating community-based health education programs. Presents classic theories of health education including the social learning theory, health belief model, and the attribution theory. Reviews relevant health education programs. Examines various learning styles and skills. Basic health education models are introduced and critiqued through individual and group projects. Reviews health education professional organizations and associations. Each student is required to design a health education program for a selected population. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 443: Aging and Disability
Provides comprehensive overview of aging and disability. Includes introduction to the field of geriatrics, age related disabilities, and the experiences of people with disabilities as they age. Presents an interdisciplinary perspective. Incorporates social, environmental, cultural, economic and historical issues related to disability and aging. Film, narrative, biography and guest speakers provide students with first-hand accounts of elders with disabilities. Restricted to students approved for appropriate senior year track in the Health Science major. Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 446: Disability Health and Community
Presents a comprehensive view of health and community concerns experienced by people with disabilities. Explores historical analysis, biomedical discourse, cultural critique, and field research to understand the evolution of medical practices, cultural
beliefs, and social structures influencing the treatments, services, and opportunities available to people with disabilities in the United States and internationally. Includes gender, sexuality, race, poverty, "invisible disabilities", eugenics, sterilization, assisted suicide topics. Guest speakers will facilitate a multi-layered understanding of the issues faced by people with disabilities and their families. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 447: Children with Disabilities
Provides a comprehensive overview of the theories of child development and issues related to children with developmental spectrum disorders, neurodevelopmental disorders, and communication and learning disorders. Includes behavioral, developmental, language, medical, motor and sensory needs of children with developmental disabilities. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 448: Disability and Employment
Presents a comprehensive overview of the Disability and Employment field. Explores pertinent employment-related legislation, the vocational rehabilitation system, the structure of existing governmental and not-for-profit programs, and current disability employment practices, through the use of didactic and experiential techniques. Emphasizes the key roles of placement professionals. Provides individualized learning opportunities for individuals with disabilities who happen to be job seeking. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 449: Project in Disability Studies
Students will develop independent projects in topic area of disability studies. They will be required to develop a set of readings, engage in a minimum of 15 hours of experiential learning [in the form of community site-visits, volunteerism, or internships]. Course instructors and assigned mentors will assist students during bi-weekly group meetings and by scheduled appointments. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
4 credits

HAN 450: Introduction to Public Health
Introduces the principles and practices of public health, including definitions and concepts, history and development, determinants of health, and ethical and legal aspects of public health. Orientates students to various public health settings such as local and state health departments, not-for-profit community organizations, and agencies for special populations. Provides students with basic knowledge and skills for conducting community needs assessment with diverse populations. Addresses infectious disease control, environmental health, chronic disease control, tobacco and drug control, maternal and child health, women's health, and injury control topics. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 452: Epidemiology and Biostatistics
Provides students with the basic knowledge and skills for studying diseases of individuals and groups. Introduces biostatistical approaches and skills for collecting and organizing data of communities to meet health needs. Addresses epidemiological concepts, limitations and resources. Through the use of case studies, students study various epidemiological models used regionally, nationally and internationally. Includes discussions about ethical situations related to research and statistical studies. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 453: Research Methods in Public Health
Focuses on the details of public health research design. Guides students through a step-by-step approach through qualitative, comparative, and quantitative research designs and analysis methods. Students will learn the language of research, various methods for conducting research and how to identify and synthesize research literature. Builds on concepts covered in the other courses in the public health/community health concentration. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
4 credits

HAN 456: Behavioral and Social Aspects of Health
Introduces social and behavioral factors as determinants of health. Explores theories of human and group behavior and health behavior change models through lecture and case study. Explores the dynamics between health behaviors and culture, gender, age and socioeconomic status. Students study various inventory tools for measuring health-related knowledge and methods for measuring behavior change. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 462: Developing Health Information Systems
Introduces students to fundamental hardware and software concepts, operating systems, GUI or desktop environments and system development life cycles. Reviews Windows applications such as spreadsheet, database, forms, queries and reports. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
4 credits

HAN 464: Health Information Systems Management
The course includes organizational change issues in health care environments, resource management (inventory, tracking and acquisition) and the role of policy formulation. Consumer issues, standards and security and the provision of health information resources to healthcare workers will also be covered. Relevant applications and issues related to health services will also be explored. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 466: Applied Health Care Informatics
Provides overview of the role of information systems in health care organizations. Emphasizes the integration of evidence-based research into clinical decision-making and the influence of information systems on health outcomes. Explores technical,
organizational and cost-benefit issues related to health care information systems, including clinical decision-support, integrated networking and distributed computing technologies, telemedicine applications and artificial intelligence solutions. Through a combination of classroom-based seminars, group case studies, and computer laboratory exercises, students will develop and exercise analytical skills for appraising health information systems, as well as acquire practical experience using biomedical research databases, desktop application software, and electronic communication systems. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**3 credits**

**HAN 472: Emergency Response to Hazardous Materials and Terrorism**

Students will learn how healthcare providers recognize and respond to hazardous material (HAZMAT) and terrorist incidents. Includes management strategies for hazardous materials incidents; identification of on-scene indicators of a suspicious incident; recognition of the tactics and objectives of terrorism; and scene perimeter control issues unique to a terrorist incident. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**3 credits**

**HAN 474: Industrial Hygiene**

Introduces basic concepts of industrial hygiene. Presents the methodology and procedures that professionals in the field use to identify, measure, and correct hazards in the work environment. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**4 credits**

**HAN 476: Hazardous Materials, Emergency Response and Environmental Auditing**

Concentrates on the nature of hazardous materials and how they are handled in the workplace. Presents the fundamentals of emergency response planning and how to perform environmental audits. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**4 credits**

**HAN 477: Medical Emergencies**

Presents concepts and issues critical to assessment and care of patients presenting with medical emergencies. Covers pathophysiology, medical patient assessment, and management of medical emergencies. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**3 credits**

**HAN 478: Internship in Environmental Health**

Proposals for special projects involving advanced readings, reports and discussions on selected environmental health topics must be submitted. A research paper on the selected topic will be submitted to an assigned faculty sponsor. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**2 credits**

**HAN 481: Introduction to Anesthesia**

Introduces the basics of the anesthesia specialty. Defines the role of the anesthesia specialist as an integral part of the patient care team. Through the use of lecture, video, tour, and hand-on demonstration, students will gain a working knowledge of how to assist anesthesiologists and anesthetists in the acquisition, preparation and application of equipment and supplies required for the administration of anesthesia. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**2 credits**

**HAN 482: Introduction to Pathology**

Pathology is the branch of medicine devoted to the study and understanding of disease. This course will introduce the student to the concept of disease. The types of growth, causative factors and biological behavior of neoplastic diseases are discussed. Staging procedures are introduced. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**3 credits**

**HAN 483: Cardiopulmonary Physiology for Anesthesia Technology**

Familiarizes students with the anatomical structures and physiological mechanisms and functions of the cardiopulmonary system. Reviews mathematical formulas and calculations used in clinical applications of physiologic concepts. Restricted to students approved for appropriate senior year track in the Health Science major.

**Prerequisite:** Admission to HAN 400 level classes

**3 credits**

**HAN 485: Clinical Monitoring**

Provides students with a working knowledge of clinical monitoring devices and their
application to clinical settings. Covers duties of anesthesia technologist including the provision of technical support to professional staff in order to facilitate anesthesia departmental function. Student develops skills to maintain and organize the anesthesia environment, equipment and supplies. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes

1 credit

HAN 486: Principles and Practice of Radiation Therapy

Introduces student to the practice and technical aspects of radiation therapy. An overview of cancer to include: statistics, epidemiology, etiology, patient education and assessment, and pharmacology and drug administration. Radiation therapy techniques specific to anatomical site will be demonstrated and treatment outcome statistics discussed. Explores treatment options available to cancer patients. Introduces practice and technical aspects of radiation therapy, including techniques specific to anatomical sites and treatment outcome statistics and options available to cancer patients. Includes cancer statistics, epidemiology, etiology, patient education and assessment; a review of the emotional and physical needs of cancer patients; and pharmacology and drug administration. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes

3 credits

HAN 487: Introduction to Treatment Planning

Provides a detailed exploration of treatment planning in the field of radiation therapy. Includes, but is not limited to, in-depth instruction in planning algorithms, data transfer, dose computation, plan evaluation and implementation, and Quality Assurance (QA). Reviews and discusses a variety of treatment planning systems and treatment machines. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes

3 credits

HAN 489: Pharmacology for Anesthesia Technology

Presents basic principles of pharmacologic properties and clinical applications. Through the use of lectures and scenarios, provides working knowledge base of drug classifications and their modes of action to produce therapeutic effects on target sites. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes

4 credits

HAN 490: Fundamentals of Medical Dosimetry and Contouring

Covers a variety of Radiation Therapy disease sites that are fundamental to the planning competencies required during the clinical year. Includes radio-geographical cross-sectional anatomy using Computerized Tomography (CT), Positron Emission Tomography (PET) and Magnetic Resonance Imaging (MRI) imaging; full-body anatomical contouring; tolerance doses for critical organs; patient treatment setup; immobilization devices; beam modifiers; Dose Volume Histograms and electron planning including but not limited to 3 Dimensional (3D) planning vs. Intensity Modulated Radiation Therapy (IMRT) of all competency sites. Discussions include Radiation Therapy Oncology Group (RTOG) protocols of all competency sites. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes

4 credits

HAN 492: Radiation Oncology/Medical Physics II

Provides students interested in a career in medical dosimetry with an introduction to medical physics for radiation oncology. This is the second course in a two-part series that provides the basis for further study of the applications of radiation oncology physics to radiation treatment planning and radiation dose calculations. Covers topics such as radiation dose distribution, patient dose calculations, treatment planning, electron beam therapy, brachytherapy, modern treatment delivery, and radiation protection. Restricted to students approved for appropriate senior year track in the Health Science program.

Prerequisite: Admission to HAN 400 level classes

4 credits

HAN 499: Health Science Teaching Practicum

Advanced students assist faculty members teaching Health Science courses. In addition to working as tutors during instructional periods, students have regular conferences with a faculty supervisor. Students may not serve as teaching assistants in the same course twice. Permission of the instructor is required.

Prerequisite: Admission to Undergraduate Health Sciences Center program

1-2 credits