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, disability studies, environmental health, health care informatics, health care management, medical billing and coding, pharmacy technician, and public health. Clinical concentrations of study include anesthesia technology, and medical dosimetry, emergency and disaster management, 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)

Requirements for Enrollment in Senior-Year Courses in the Major in Health Sciences (HAN)

While there is no formal application process, students should complete these requirements before advancing to the senior year courses in the program.
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 (D.E.C.)
3. Completion of a minimum of 16 credits in the natural sciences (D.E.C. category E)
4. Completion of 21 credits in related electives courses (see listing below)

Note: The 16 credits in natural sciences courses used to satisfy Requirement 3 may not be used to satisfy this requirement.
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.

Note: 10 credits of computer science/information systems electives are strongly recommended as prerequisites for the Health Care Informatics concentration. CSE 101, CSE 113, and CSE 114 are strongly recommended.

Requirements for the Major

Note: See the Health Sciences Center Bulletin for course descriptions not included in this Bulletin.
Senior Year Health Science (HAN)
The major in Health Science leads to the Bachelor of Science degree. Completion of the degree requires a minimum of 29 credits after achieving senior status and advancement to senior-year courses. To be in good standing in the School of Health Technology and Management, the student must maintain a minimum 2.00 cumulative g.p.a. and a 2.50 minimum g.p.a. in required professional (HAN) courses. A minimum grade of C is required in each core Health Science program course before a student is permitted to advance to the concentration courses. If a student receives a grade less than C in any of the HAN courses, the course must be repeated.

Core Courses

To be completed during the first semester, senior year. Students must enroll in 15 credits of core health science courses including:

1. HAN 300 Health Care Issues
2. HAN 333 Communication Skills
3. HAN 335 Professional Ethics
4. HAN 364 Issues in Health Care Informatics
5. HAN 383 Professional Writing

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 436 Continuous Quality Improvement in Health Care
4. HAN 435 Sales and Marketing 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. Students who successfully complete this concentration may be eligible to apply for the national certification examination of health educators. 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 Intro. 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 specialization prepares the student for a career in health care information systems, 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
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 Environmental Health, Radiation Safety, and Safety Engineering
2. HAN 474 Industrial Hygiene
3. HAN 476 Hazardous Materials, Emergency Response, and Environmental Auditing
4. HAN 478 Independent Study

F. Medical Billing and Coding
This concentration provides students with the knowledge and skills required to enter the healthcare industry in the field of medical billing and coding. Coursework covers the practices and procedures for coding, reimbursement, medical records issues, and The Centers for Medicare and Medicaid Services guidelines.
1. HAN 420 ICD-9-CM for Medical Billers and Coders
2. HAN 421 CPT for Medical Billers and Coders
3. HAN 422 Medical Billing Methodologies
4. HAN 423 Clinical Records

G. Disability Studies
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 Disability and Employment
5. HAN 449 Project in Disability Studies

H. Pharmacy Technician
This concentration provides students with the knowledge and skills required for competent performance as nationally certified pharmacy technicians in either hospital or retail settings.

1. HAN 411 Math and Dosage Calculations for the Pharmacy Technician
2. HAN 412 Legal and Ethical Issues for Pharmacy Technicians
3. HAN 413 Pharmacology for Pharmacy Technicians
4. HAN 414 Pharmacy Technician I
5. HAN 415 Pharmacy Technician II

I. Medical Dosimetry
This concentration is designed to provide students with the knowledge and skills necessary to be a Radiation Therapy Aide. Upon graduation, students may apply for admission to the 12-month, hospital-based post-baccalaureate Medical Dosimetry program, which prepares students for entry-level medical dosimetry positions. A Medical Dosimetrist is a member of the Radiation Oncology team who has the education and expertise necessary to generate radiation dose distributions and dose calculations in collaboration with the medical physicist and the radiation oncologist for cancer patients.

1. HAN 480 Intro. to Radiation Therapy and Medical Dosimetry
2. HAN 482 Intro. to Pathology
3. HAN 486 Principles and Practices of Radiation Therapy
4. HAN 488 Medical Imaging and Radiographic Anatomy
5. HAN 492 Radiation Oncology/Medical Physics II

J. Emergency and Disaster Management: EMT-Paramedic
This concentration expands upon conventional Emergency Medical Services (EMS) training and better prepares EMS personnel for the realities of today’s workforce. Curriculum provides a foundation in the recognition and management of HAZMAT incidents, a comprehensive overview of nuclear, biological, and chemical agents that are more likely to be used as weapons of mass destruction, and an understanding of the tactics and objectives of terrorism. Students will also be trained as EMTs through a 120-hour EMT course. Graduates of this major will be the first generation of baccalaureate-prepared emergency medical technicians who are also intensely prepared in emergency and disaster management. These highly trained EMS providers will then enter our nationally recognized paramedical training major (1204 hours of study).
Job opportunities may be found in private or public ambulance companies, fire departments and hospitals.

1. HAN 370 Pre hospital Care
2. HAN 472 Weapons of Mass Destruction
3. HAN 473 Emergency Response to Terrorism
4. HAN 477 HAZMAT Training for EMS

For admission requirements to the clinical concentrations, please refer to the SHTM Web site at http://www.hsc.stonybrook.edu/shtm/bshs.

K. Nuclear Medicine Technology
This new 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.

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://www.hsc.stonybrook.edu/shtm/bshs.

L. 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.

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 website at www.hsc.stonybrook.edu/shtm/bshs.

M. Anesthesiology Technology
Designed to provide students with knowledge and skills for entry-level non-clinical positions in the field of anesthesiology technology. Upon graduation, students may apply for admission to the 10-month, post-baccalaureate hospital-based Anesthesiology Technology program, which prepares students as entry-level members of anesthesia teams. Consult the Health Sciences Center Bulletin for admission requirements.

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

Stony Brook University: www.stonybrook.edu/ugbulletin
For admission requirements to the clinical concentrations, please refer to the SHTM Web site at www.hsc.stonybrook.edu/shtm/bshs.

Related Electives
2. AMS courses: AMS 102 Elements of Statistics, AMS 110 Probability and Statistics in the Life Sciences
3. ANP 300 Human Anatomy
4. ANT courses: ANT 102 Introduction to Cultural Anthropology, ANT 290 Science and Technology in Ancient Society, ANT 350 Medical Anthropology, ANT 367 Male and Female
5. BCP 394/MAR 394 Environmental Toxicology and Public Health
6. BIO courses: BIO 208 Cell, Brain, Mind, BIO 358 Biology and Human Social and Sexual Behavior
8. CFS courses: CFS 210 Introduction to Human Growth and Development in the Family Context, CFS 308 Violence in the Family, CFS 320 The Special Child
10. ECO courses: ECO 108 Introduction to Economic Analysis, ECO 303 Intermediate Microeconomics
11. HAD 210 Introduction to CLS
12. HAS 190/HNI 190 Introduction to the Health Professions, HAS 290 Medicine and Society
13. HAT 210 Introduction to Respiratory Care
14. HBP 390 Basic Mechanism in Pathology, HDH 301 Independent Readings and Research (Dental Health)
16. HMC courses: HMC 200/SOC 200 Medicine and Society, HMC 331 Legal and Ethical Issues in Healthcare
17. HSQ courses: HSQ 270 Emergency Response, CPR and Personal Safety, HSQ 271 Instructor of CPR, HSQ 272 Instructor of First Aid HSQ 325, HSQ 326 Instructor of Adapted Aquatics I, II, HSQ 329 Fieldwork in Adapted Aquatics Instruction
19. LCR courses: LCR 200 The Nature of Community, LCR 201 Social Action Research, LCR 488 Internship, LCR 490 Senior Seminar
20. LHD courses: LHD 101 Human Development Seminar, LHD 301, 302, 401 Human Sexual and Gender Development Issues, LHD 305, 306 HIV Reduction in the Campus Community, LHD 307, 308 Lab in HIV Reduction in the Campus Community, LHD 402 Parenting Children
21. LHW courses: LHW 102 Intro. to Health Professions, LHW 301 Issues in Health and Wellness, LHW 488 Internship
22. LRN courses: LRN 104 The Person, LRN 105 Ecology and Society, LRN 131 Thinking About Science, LRN 132 Thinking About Biology
23. MAR 340 Environmental Problems and Solutions
24. MEC 280 Pollution and Human Health
25. PHI 376 Philosophy and Medicine
28. SSE courses: SSE 350 Foundation of Education

Note on Related Electives:
Health Care Informatics: Ten credits in computer science electives are required; CSE 101 and CSE 114 are strongly recommended. In addition, students are encouraged to choose courses with designators BUS, CSE, ECO, and PSY.

 Relevant electives are subject to change. Call (631) 444-BSHS for current electives.
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 cell, tissue and organ system levels of organization, with emphasis on understanding disease processes associated with systems. This course is designed for Health Science (HAV) majors, particularly those interested in pursuing HAN clinical concentrations of study. Open to non-HSC students. Prerequisite: one BIO course
3 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, blood composition, the cardiovascular system, the lymphatic system, the immune system, the respiratory system, the digestive system, nutrition, the urinary system, the reproductive system, fluid, electrolyte and acid-base balance and heredity. This course is designed for Health Science majors (HAV), particularly those interested in pursuing HAN clinical concentrations of study. Prerequisite: HAN 200.
3 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: Medical Terminology and Human Anatomy
Provides the medical terminology and human anatomy needed for non-clinical roles in healthcare. Presents medical terminology through didactic and experiential techniques by reviewing the digestive, urinary, integumentary, reproductive, respiratory, endocrine, nervous, musculoskeletal, cardiovascular and lymphatic systems. Students will learn how to build a medical vocabulary and understand the importance of precise communication in the delivery of health care. Open to non HSC students.
2 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 336: 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 370: Prehospital Care
Provides necessary knowledge and skills to recognize signs and symptoms of illness and injury and the appropriate application of emergency medical care. Upon successful completion of the course and the completion of a 24-hour clinical observation rotation, students will be eligible to take the New York State Department of Health Emergency Medical Technician (EMT) exam. Includes advanced pathophysiology and expands upon the EMT training curriculum. Serves as a prerequisite course for paramedic training. Restricted to students approved for appropriate senior year track in the Health Science major.
Prerequisite: Admission to Undergraduate Health Sciences Center program
6 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, 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 392: Radiation Oncology/Medical Physics I
Provides students interested in a career in medical dosimetry with an introduction to medical physics for radiation oncology. First of a two-part course that provides the basis for further study of the applications of radiation oncology physics to radiation treatment planning and radiation dose calculations. Includes topics such as structure of matter, nuclear transformations, x-ray production, radiation generators, interaction of radiation with matter, measurement of ionizing radiation, quality of x-rays, and measurement of absorbed dose. Restricted to HAN majors.
Prerequisite: Admission to Undergraduate Health Sciences Center program
4 credits

HAN 394: Imaging Physics
Provides an introduction to Radiological Physics for students interested in a career in medical imaging or radiation therapy. Elements of general physics relevant to Radiological Sciences are presented. Topics include production of radiation, radioactivity, interaction of radiation with matter, radiation detection, nuclear magnetic resonance, and production and detection of ultrasound. Restricted to HAN majors
Prerequisite: Admission to Undergraduate Health Sciences Center program
3 credits
HAN 395: Radiation Physics in Medicine
Provides 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
4 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
Prerequisite: Admission to HAN 400 level classes
3 credits

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
Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 405: Radiographic Technique
Focuses on production of radiographic image. Includes rationale for selection of technical factors, factors 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
Prerequisite: Admission to HAN 400 level classes
3 credits

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
Prerequisite: Admission to HAN 400 level classes
6 credits

HAN 410: Survey of Nursing
Provides introduction and overview of nursing concepts. Addresses the realities of work and social and political pressures of the nursing profession.
Prerequisite: Admission to HAN 400 level classes
2 credits

HAN 411: Math and Dosage Calculations for the Pharmacy Technician
Comprehensive overview of math concepts essential to the practice of the pharmacy technician's skill set. Through extensive work with fractions, decimals, ratios, percentages, and alligations, students will be able to develop the skills necessary to calculate doses and prepare medications. Apothecary, Avoirdupois, and Metric systems will be explained and compared. Prepares student to function as a technician on the national level while clearly delineating the role as prescribed by New York State law. Restricted to students approved for appropriate senior year track in the Health Science major.
Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 412: Legal and Ethical Issues for Pharmacy Technicians
Comprehensive overview of the laws governing the practice of pharmacy on both the state and Federal levels. Focus is on the scope of practice and the legal and ethical role of the pharmacy technician. Regulatory agencies and professional organizations will be discussed in depth. Restricted to students approved for appropriate senior year track in the Health Science major.
Prerequisite: Admission to HAN 400 level classes
2 credits

HAN 413: Pharmacology for Pharmacy Technicians
Comprehensive overview of all categories of prescription and non-prescription medications. Emphasis is placed on drug classes and mechanism of action in order to provide understanding of why certain drugs are prescribed for certain disease states. Topics will include drug classes, pharmacokinetics, therapeutic uses, adverse effects, and drug interactions, adapted specifically for the pharmacy technician. Restricted to students approved for appropriate senior year track in the Health Science major.
Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 414: Pharmacy Technician I
Comprehensive overview of topics and subjects relevant to the skills set of pharmacy technicians in both hospital and retail settings. Focus is on service aspects, roles, prescription filling, order filling, preparation of products, and proper use of equipment, inventory
management, pharmacy literature, and reimbursement. Prepares student to function as a technician on the national level while clearly delineating the role as prescribed by New York State law. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 415: Pharmacy Technician II
Comprehensive overview of topics and subjects relevant to the skills set of pharmacy technicians, specifically in the retail settings. Focus is on service aspects, roles, prescription filling, order filling, preparation of products, and proper use of equipment, inventory management, pharmacy literature, and reimbursement. Prepares student to function as a technician on the national level while clearly delineating the role as prescribed by New York State law. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 418: Pharmacy Technician Retail Clinical
Experiential practicum enables the student to practice as a pharmacy technician in the retail setting under the supervision of an approved preceptor. The focus of this experience will include: the role of the pharmacy technician in the retail setting, customer service principles, prescription reading, patient profiles, preparation of prescriptions for filling, third party billing, cash handling, purchasing, and use of the computer. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 419: Pharmacy Technician Hospital Clinical
Experiential practicum enables the student to practice as a pharmacy technician in the hospital setting under the supervision of an approved preceptor. The focus of this experience will include: the role of the pharmacy technician in the hospital setting, customer service principles, prescriber order reading, patient profiles, preparation of medications for order filling, aseptic technique, preparation of intravenous and extemporaneous medication and use of the computer. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 420: ICD-9-CM for Medical Billers and Coders
Comprehensive overview of the practice and procedure of International Classification of Diseases, 9th Revision, Clinical Modification, (ICD-9-CM) 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, Uniform Hospital Discharge Data Set (UHDDS) definitions and ICD-9-CM codes to hospital inpatient records, identification of patient encounter types, and interpretation of health/medical records. Course will also cover Supplementary Classification such as E and V Codes. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 421: CPT for Medical Billers and Coders
Comprehensive overview of the practice and procedures of the Current Procedural Terminology (CPT-4) code set. Topics include: interpreting conventions, formats and instructional notations; definitions of the classification system and CPT nomenclature; and applying 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.

Prerequisite: Admission to HAN 400 level classes
4 credits

HAN 422: Medical Billing Methodologies
Comprehensive overview of the practice and procedures of the Medical Billing in both the hospital and physician’s office. Topics include the link between International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) diagnoses and Current Procedural Terminology (CPT-4) procedure coding for reimbursement, reimbursement methodologies, medical records issues, and guidelines of the Health Care Financing Administration (HCFA) and Evaluation and Management codes and guidelines. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 423: Clinical Records
Exposes students to actual medical records from a variety of clinical settings: ambulatory surgery centers, emergency departments and various inpatient and outpatient hospital departments. Focuses on an intensive application of coding skills. Advanced areas of medical records coding will emphasize sequencing of multiple diagnoses and procedures to assure correct reimbursement. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

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
6 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
4 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 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 445: Independent Living and Disability
Interdisciplinary exploration of how independent living has evolved as a social and political movement. Topics include analyzing current legislation, social issues and living philosophies. Guest speakers will facilitate the students gaining a multi-layered understanding of the issues faced by people with disabilities who are living independently. 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. Orients 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
3 credits

HAN 454: Issues in Public Health

Addresses contemporary topics related to public health policies and practices. Topics include recent regional and national pandemics, changes in public health prevention programs and current political policy-making. Introduces health trends and patterns through the study of changing laws and policies governing public health services and education. Guest lecturers from the county health departments and local community health and public health organizations present up-to-date information on public health issues. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 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
4 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 467: Utilization and Outcomes Research Methods
Provides the necessary tools to evaluate and implement research methods and utilize outcomes within the health care system. Presents an overview of statistics and research methods and evaluation techniques by utilizing group discussions and case studies. Demonstrates the utilization of technology as a resource for existing research as well as management tools. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 470: Environmental Health, Radiation Safety and Safety Engineering
Presents an overview of the field of occupational health and safety. Focuses on three key areas including radiation protection, environmental health, and safety engineering. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
4 credits

HAN 472: Weapons of Mass Destruction: Nuclear, Biological and Chemical Agents
Presents a comprehensive overview of nuclear, biological incendiary, chemical and explosive agents that are more likely to be used as Weapons of Mass Destruction (WMD). Expands the Emergency Medical Service (EMS) provider's training in responding to conventional HAZMAT incidents and focuses on the recognition and management of incidents involving bioterrorism, chemical and nuclear weapons. Restricted to students approved for appropriate senior year track in the Health Science major.

Prerequisite: Admission to HAN 400 level classes
3 credits

HAN 473: Emergency Response to Terrorism
Prepares Emergency Medical Service (EMS) providers to recognize and respond to terrorist incidents. Topics include identification of on-scene indicators of a suspicious incident, recognition of the tactics and objectives of terrorism, and scene/perimeter control issues that are 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 475: Emergency Medical Services Management
Introduces students to the concepts and issues critical to the operation of emergency medical service systems. Includes system development, communication, finance, continuous quality improvement, research, and response to disasters and mass gatherings.

Prerequisite: Admission to Undergraduate Health Sciences Center program
3 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: HAZMAT Training for Emergency Medical Services
Comprehensive overview of the practice and procedures required of Emergency Medical Service (EMS) providers when responding to major HAZMAT incidents. Includes management strategies for Hazards Materials (HAZMAT) disasters. Emphasizes the coordination of services and resources by national, federal and local agencies. 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: Independent Study 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 480: Introduction to Radiation Therapy and Medical Dosimetry
Provides students with a history and an overview of radiation therapy and medical dosimetry and their role in medicine. Students will be oriented to academic and administrative structure, key departments and personnel. Introduces other health science professions and how they interrelate to the radiation therapy and medical dosimetry professions. The student will be oriented to the hospital organization and radiation oncology services organization. Certification examinations, professional credentialing, accreditation, and professional organizations will be identified and discussed. The clinical education component will be introduced and emphasis placed upon how knowledge, attitudes and skills will be applied within the clinical setting, and what teaching must occur in the clinic. A detailed list and explanation of the clinical duties and responsibilities of radiation therapy and medical dosimetry students will be provided. Career advancement and mobility will be explored. Restricted to students approved for appropriate senior year track in the Health Science program.

Prerequisite: Admission to HAN 400 level classes
1 credit

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

**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

**HAN 483: Cardiopulmonary Physiology for ASATT**

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

**HAN 484: Radiation Therapy Physics**

Introduces students interested in a career in radiation therapy to medical physics for radiation oncology. It will provide 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

**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. Restricted to students approved for appropriate senior year track in the Health Science major.

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

**4 credits**

**HAN 488: Medical Imaging and Radiographic Anatomy**

Presents an overview of a variety of diagnostic imaging modalities and therapeutic applications and procedures provided by modern health care facilities. Discusses imaging equipment and procedures, and includes recording images on film media and operation of photochemical processing equipment. Restricted to students approved for appropriate senior year track in the Health Science program.

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

**3 credits**

**HAN 489: Pharmacology for ASATT**

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 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.