

HEALTH SCIENCE CAREER CLUSTER DESIGN & DESCRIPTIONS

Health Science Pathway – CIP Code 51.9999

Approved Pathway:

- 1) Includes minimum of three secondary-level credits.
- 2) Includes a work-based element.
- 3) Consists of a sequence: Introductory-level, Technical-level, and Application-level courses.
- 4) Supporting documentation include Articulation Agreement(s) and a Program of Study.
- 5) Technical-level and Application-level courses receive .5 state-weighted funding in an approved CTE pathway.

Concentrator Requirement

For a student to be a concentrator, at least 2 of 3 required secondary level credits taken must be a combination of technical and application levels.

INTRODUCTORY LEVEL

Health Science IA	14000	.5 credit	OR	Health Science IB	14001	1 credit
Biology ✓	03051	1 credit		Chemistry	03101	1 credit

TECHNICAL LEVEL

General:

*Human Body Systems ✓	14102	1 credit	OR	*Anatomy & Physiology ✓	03053	1 credit
*Health Science II	14002	1 credit		AP Biology ✓	03056	1 credit
Nutrition & Wellness A	08057	.5 credit	OR	Nutrition & Wellness B	08067	1 credit
Medical Terminology A	14154	.5 credit	OR	Medical Terminology B	36154	1 credit
Health Information (HIT)	14157	1 credit		Special Health Science Topics A	14254	.5 credit
Special Health Science Topics B	36254	1 credit				

Sports Care & Rehabilitation:

Physical Therapy	14060	.5 credit		Care of Athletes	14062	.5 credit
Sports Medicine I	14072	1 credit				

Medical:

Emer. Medical Technology A	14055	.5 credit	OR	Emer. Med. Technology B	36055	1 credit
Medical Imaging A	14103	.5 credit	OR	Medical Imaging B	14149	1 credit
Medical Interventions	14105	1 credit		Prin. Of Biomed Science ✓	14251	1 credit
Biotechnology I A	14252	.5 credit	OR	Biotechnology I B	36252	1 credit

Pharmacology ✓

Health Care:

Nursing I	14051	.5 credit		First AID/CPR/EMR	44050	.5 credit
Home Health Care	14053	.5 credit		EMT	44060	1 credit

APPLICATION LEVEL

Nursing II	14052	.5 credit		Sports Medicine II	14073	1 credit
Biomedical Innovation ✓	14255	1 credit		Phlebotomy Technician	14104	.5 credit
Biotechnology II	14256	1 credit		Certified Nursing Assistant	14997	.5 credit
Health Science III	36991	1 credit		Proj. Mgmt & Resource Sched.	21205	1 credit
Health Science IV (Shadow/Work)	36992	1 credit		Certified Medication Aide	36156	.5 credit
Health Sci. V (Shadow/Work)	36993	2 credit		Home Health Aide	36053	.5 credit
Forensic Science ✓	44224	.5 credit	OR	Forensic Science Comp. ✓	44225	1 credit

*Select one for pathway approval. ✓Eligible for Regents Qualified Admissions – Natural Science

Boldfaced courses may require specialized teacher certification and/or offer professional certification.

All one credit courses may be taught as two .5 credit courses.

03051 Biology (1 credit) – Biology courses are designed to provide information regarding the fundamental concepts of life and life processes. These courses include (but are not restricted to) such topics as cell structure and function, general plant and animal physiology, genetics, and taxonomy. Special attention should be given to health careers, related technical skills, and technology associated with these professions.

03053 Anatomy and Physiology (1 credit) – Usually taken after a comprehensive initial study of biology, Anatomy and Physiology presents the human body and biological systems in more detail. In order to understand the structure of the human body and its functions, students learn anatomical terminology, study cells and tissues, explore functional systems (skeletal, muscular, circulatory, respiratory, digestive, reproductive, nervous, and so on), and may dissect mammals. Special attention should be given to health careers, related technical skills, and technology associated with these professions.

03056 Advanced Placement (AP) Biology (1 credit) – Adhering to the curricula recommended by the College Board and designed to parallel college level introductory biology courses, AP Biology courses stress basic facts and their synthesis into major biological concepts and themes. These courses cover three general areas: molecules and cells (including biological chemistry and energy transformation); genetics and evolution; and organisms and populations (i.e., taxonomy, plants, animals, and ecology). AP Biology courses include college-level laboratory experiments. Special attention should be given to health careers, related technical skills, and technology associated with these professions.

08057 Nutrition and Wellness A (.5 credit) – Focusing on personal, consumer, and industry nutrition and wellness topics; such as general and individual nutrition, stress management, drug/alcohol abuse prevention, disease prevention, exercise, diet, safety, physical activity, aging, and general first aid. Course objectives include helping students develop decision-making, communication, interpersonal, and coping skills and strategies.

08067 Nutrition and Wellness B (1 credit) – Focusing on personal, consumer, and industry nutrition and wellness topics; such as general and individual nutrition, stress management, drug/alcohol abuse prevention, disease prevention, exercise, diet, safety, physical activity, aging, and general first aid. Course objectives include helping students develop decision-making, communication, interpersonal, and coping skills and strategies. Special attention will be made to careers in health that incorporate both nutrition and wellness of the individual, a group, regionally and globally as part of their duties.

03101 Chemistry (1 credit) – Chemistry courses involve studying the composition, properties, and reactions of substances. These courses typically explore such concepts as the behaviors of solids, liquids, and gases; acid/base and oxidation/reduction reactions; and atomic structure. Chemical formulas and equations and nuclear reactions are also studied. Special attention should be given to health careers, related technical skills, and technology associated with these professions.

14000 Health Science I A (.5 credit) – Provides students with the basic knowledge of health/wellness professionals in private business and industry, community organizations, and health care settings, as well as job opportunities, wage, and duties. This class includes instruction in personal health, community health and welfare, nutrition, epidemiology, disease prevention, fitness and exercise, and health behaviors that are associated with various health careers.

14001 Health Science I B (1 credit) – Provides students with the basic knowledge of health/wellness professionals in private/public business, community organizations, and health care settings, as well as job opportunities, wage, and duties. This class includes instruction in personal health, community health and welfare, nutrition, epidemiology, disease prevention, fitness and exercise, and health behaviors that are associated with various health careers. A variety of health related skill sets may be covered, such as first aid, CPR, EMR, patient vitals, using medical equipment/tools, and electronic record keeping.

14002 Health Science II (1 credit) – Provides students with the extensive knowledge of health/wellness professionals in private/public industry, community organizations, and health care settings, as well as job opportunities, wage, and duties. Students will gain extensive knowledge of the various systems of the

human body, how they interact, and common medical terminology associated. This class includes instruction in personal health, nutrition, dietary needs, anatomy, fitness, biology, body systems, and diseases. A variety of health related skill sets may be covered, such as first aid, CPR, EMR, patient vitals, anatomy identification, using medical equipment/tools, and electronic record keeping.

14051 Nursing I (.5 credit) – Students gain knowledge of the variety of occupations/careers in nursing and what is required to work in, plan, manage, assist and evaluate with in these area. They will gain in-depth knowledge of duties of selected careers in nursing, common skill sets, licensure requirement, legal regulations, safety, and required electronic record keeping. May include study of instruction in general care for adult patients, surgery, epidemiology, biostatistics, pediatrics, public health principles, preventive medicine, health policy and regulations, health care services, public health law enforcement, and professional standards and ethics. Collaboration with local nurses and other healthcare professionals is encouraged.

14052 Nursing II (.5 credit) – Students gain knowledge in selected occupations/careers in nursing and what is required to work in, plan, manage, assist and evaluate with in these area. They will gain in-depth knowledge of duties of specific careers in nursing, common skill sets, licensure requirement, legal regulations, safety, and required electronic record keeping. May include study of instruction in general care for adult patients, surgery, epidemiology, biostatistics, pediatrics, public health principles, preventive medicine, health policy and regulations, health care services, public health law enforcement, and professional standards and ethics. Collaboration with local nurses and other healthcare professionals is encouraged.

14053 Home Health Care (.5 credit) – This class will teach students how to care for individuals within their homes. Course content relates health care practices and procedures to the home environment, and typically includes patient care, comfort, and safety; anatomy and physiology; the prevention of disease and infection; nutrition and meal preparation; human relations; and first aid and CPR. Topics covered may also include therapy strategies, household management, and employability.

14055 Emergency Medical Technology A (.5 credit) – Place a special emphasis on the knowledge and skills needed in medical emergencies. Topics typically include clearing airway obstructions, controlling bleeding, bandaging, methods for lifting and transporting injured persons, simple spinal immobilization, infection control, stabilizing fractures, and responding to cardiac arrest. The courses may also cover the legal and ethical responsibilities involved in dealing with medical emergencies. Not a certifying course.

14060 Physical Therapy (.5 credit) – This class will provide students with a knowledge of the Physical Therapy field, career opportunities, common duties, and the outlook of the profession. Students will gain understanding of the skills necessary to work with patients who need to achieve and maintain functional rehabilitation and to prevent malfunction or deformity. Topics covered typically include therapeutic exercises and activities (such as stretching and strengthening), how to train patients to perform the activities of daily living, the use of special equipment, and evaluation of patient progress.

14062 Care of Athletes (.5 credit) – Provide students with the knowledge of therapeutic tasks that would be designated by an athletic or fitness trainer. Topics covered may include taping and bandaging, proper use of protective padding, treatment modalities, anatomy and physiology, and medical terminology. Students may learn the processes to measure cardiorespiratory endurance, muscular strength and endurance, flexibility, body composition, and blood pressure. More advanced topics may include injury assessment, the phases of healing, and the use of exercise and equipment to help in the reconditioning of injured athletes.

14072 Sports Medicine I (1 credit) – Provide students an overview of the specialized health care needed in the wide world of sports and physical activity. Students will learn what sports medicine is and the multidisciplinary approach to athletic health care. The course will also introduce students to basic body systems in addition to the physical and mental demands of physical activity at all levels. The students will be introduced to such things as kinesiology, bleeding

and shock, the bones and soft tissue, the foot, ankle, and lower leg, the knee, the hip and pelvis, the elbow, wrist, and hand, the shoulder, the chest and abdomen, the head and face, the spine, and lastly special considerations in athletes.

14073 Sports Medicine II (1 credit) – Topics to be covered are the central training room, the athletic training student-aid program, emergency preparedness, injury game plan, the pre-participation physical examination, rehabilitation and preseason conditioning, nutrition and the athlete, dietary supplements and performance enhancers, sports psychology, assessment and evaluation of sports injuries, therapeutic physical modalities, and proper taping and wrapping. This course allows students to collaborate with medical professionals in the community pertaining to sports medicine. These interactions are designed for students who have a serious interest in pursuing a career in the sports medicine field.

14102 Human Body System (1 credit) – Students will gain extensive knowledge of the various systems of the human body, how they interact, and common medical terminology associated. Usually taken after a comprehensive initial study of biology, this class will present the human body and biological systems in more detail. In order to understand the structure of the human body and its functions, students learn anatomical terminology, study cells and tissues, explore functional systems (skeletal, muscular, circulatory, respiratory, digestive, reproductive, nervous, and so on).

14103 Medical Imaging A (.5 credit) – Students acquire the knowledge and understanding of the skills needed for variety of careers in medical/diagnostic imaging. This class will look at the areas of X-ray radiography, magnetic resonance imaging (MRI), medical ultrasonography or ultrasound, endoscopy, elastography, tactile imaging, thermography, medical photography and nuclear medicine functional imaging techniques as positron emission tomography. These courses usually include general health care topics as well, such as basic anatomy and physiology, patient care, identification and use of medical equipment, and medical terminology.

14104 Phlebotomy Technician (.5 credit) - Prepares students, under the supervision of physicians and other health care professionals, to draw blood samples from patients using a variety of intrusive procedures. This class includes instruction in basic vascular anatomy and physiology, blood physiology, skin puncture techniques, venipuncture, venous specimen collection and handling, safety and sanitation procedures, and applicable standards and regulations associated with phlebotomy. This class results in the opportunity to test for KS certification as a Phlebotomy Technician.

14105 Medical Interventions (1 credit) – Students explore and identify the wide area of medical interventions and how health care professionals and researchers have identified causes and solutions to improve overall public healthcare. Such practitioners in allied health, dentistry, midwifery (obstetrics), medicine, nursing, optometry, pharmacy, psychology and other health professions are all involved in medical interventions. Students will explore such areas at infections, genes, cancer, organ failure, immunization, transplants, blood types, medical drugs, legal issues in health care, emerging technology, careers that use medical interventions, and safety.

14149 Medical Imaging B (1 credit) – Students acquire an in-depth knowledge and understanding of the skills needed for variety of careers in medical/diagnostic imaging. This class will look at the areas of X-ray radiography, magnetic resonance imaging (MRI), medical ultrasonography or ultrasound, endoscopy, elastography, tactile imaging, thermography, medical photography and nuclear medicine functional imaging techniques as positron emission tomography. These courses usually include general health care topics as well, such as basic anatomy and physiology, patient care, identification and use of medical equipment, and medical terminology. Collaboration with local healthcare professionals and businesses related to this area is encouraged.

14154 Medical Terminology A (.5 credit) – In Medical Terminology, students learn how to identify medical terms by analyzing their components. These courses emphasize defining medical prefixes, root words, suffixes, and abbreviations. The primary focus is on developing both oral and written skills in the language used to communicate within health care professions.

14157 Health Information (HIT) - A class that introduces and prepares students to perform credentialing, electronic record keeping, organizational personnel management, financials, purchasing, technology selection/maintenance, data management systems, and accreditation compliance services for hospitals and other health care facilities and organizations. This class includes basic instruction in medical staff organization and management, medical terminology, credentialing and re-credentialing, healthcare accreditation and regulatory standards, health care law, meeting and negotiation management, organizational budgets, financials, purchasing/maintaining inventory, and office information systems management.

14251 Principles of Biomedical Sciences (1 credit) - An in-depth look at the wide area of biomedical science and how technology, science and medicine are merged together to advance options for patients and improve public healthcare. Such disciplines as medical microbiology, clinical virology, clinical epidemiology, genetic epidemiology, and biomedical engineering are biomedical sciences. Students will explore such areas as the heart, diabetes, sickle cell, cholesterol, infectious diseases, medical interventions, legal issues in health care, emerging technology, careers in biomedical science, and safety.

14252 Biotechnology I A (.5 credit) – Students will gain knowledge in the study of the bioprocesses of organisms, cells, and/or their components and enable them to use this knowledge to produce or refine products, procedures, and techniques. Course topics typically include laboratory measurement, monitoring, and calculation; growth and reproduction; chemistry and biology of living systems; quantitative problem-solving; data acquisition and display; and ethics. Advanced topics may include elements of biochemistry, genetics, and protein purification techniques. Biotechnology has applications in four major industrial areas, including health care (medical), crop production and agriculture, non-food (industrial) uses of crops and other products (e.g. biodegradable plastics, vegetable oil, biofuels), and environmental uses.

14253 Pharmacology (1 credit) – Students will gain knowledge in the study of the bioprocesses of organisms, cells, and/or their components and enable them to use this knowledge to produce or refine products, procedures, and techniques. Course topics typically include laboratory measurement, monitoring, and calculation; growth and reproduction; chemistry and biology of living systems; quantitative problem-solving; data acquisition and display; and ethics. Advanced topics may include elements of biochemistry, genetics, and protein purification techniques. Biotechnology has applications in four major industrial areas, including health care (medical), crop production and agriculture, non-food (industrial) uses of crops and other products (e.g. biodegradable plastics, vegetable oil, biofuels), and environmental uses.

14254 Special Health Science Topics A (.5 credit) - An in-depth look at a specific topic, area of research, occupation/career, technique or skill in the health science area, which has been selected by the teacher of record for study. Students may further explore the special topic by collaborating, observing, and participating in approved activities with local and regional health care professionals to offer Professional Learning Experiences (PLE).

14255 Biomedical Innovation (1 credit) – In this application level class, students will design and conduct experiments related to the diagnosis, treatment, and prevention of disease or illness. They will apply their knowledge and skills to answer questions or to solve problems related to the biomedical sciences. They may work with a mentor or advisor from a university, hospital, physician's office, or industry as they complete their work. Students will be expected to present the results of their work to an adult audience, which may include representatives from the local healthcare or business community or the school's biomedical partnership team.

14256 Biotechnology II (1 credit) - Students will apply gained knowledge from Biotechnology I to produce or refine products, procedures, and techniques related to biological or medical systems. Course topics typically include laboratory measurement, monitoring, and calculation; growth and reproduction; chemistry and biology of living systems; quantitative problem-solving; data acquisition and display; and ethics. Exploration of health related occupations, current advances in technology, and biotechnology related projects to meet current industry needs. This class can include instruction in instrument calibration, design and installation testing, system safety and maintenance procedures, procurement and installation procedures, and report preparation.

14997 Certified Nursing Assistant [CNA] (.5 credit) - A program that prepares students to perform routine nursing-related services to patients in hospitals or long-term care facilities, under the training and supervision of an approved teacher, registered nurse or licensed practical nurse. This class results in the opportunity to test for KS certification in CNA.

21205 Project Management & Resource Scheduling (1 credit) - Provides students with the information and skills necessary for success in managing projects and operating logistical ventures in healthcare, technology, business, and industry. This course covers scheduling of resources (including personnel, budget, timelines, records, data, and equipment), utilization of Gantt charts, economic principles within the workplace, and risk management. Other possible topics include developing a business plan, finance, business law, healthcare law, marketing and promotion strategies, insurance employee/employer relations, problem-solving and decision-making, and building leadership skills. These courses may also incorporate a survey of the careers within healthcare industries.

36053 Home Health Aide (.5 credit) – This course will teach students how to care for individuals within their homes under the direct supervision of an approved teacher, nurse or physician. Course content will include patient care, comfort, and safety; anatomy and physiology; the prevention of disease and infection; nutrition and meal preparation; human relations; and first aid and CPR. Additional topics that must be included to receive a full credit are therapy strategies, household management and employability. This class results in the opportunity to test for KS certification of Home Health Aide.

36055 Emergency Medical Technology B (1 credit) – Place a special emphasis on the knowledge and skills needed in medical emergencies. Topics typically include clearing airway obstructions, controlling bleeding, bandaging, methods for lifting and transporting injured persons, simple spinal immobilization, infection control, stabilizing fractures, and responding to cardiac arrest. The courses may also cover the legal and ethical responsibilities involved in dealing with medical emergencies, occupations related to this area of study, and educational requirements. Not a certifying course.

36154 Medical Terminology B (1 credit) – In Medical Terminology, students learn how to identify medical terms by analyzing their components. These courses emphasize defining medical prefixes, root words, suffixes, and abbreviations. The primary focus is on developing both oral and written skills in the language used to communicate within health care professions. Students will develop skills in terminology used for charting, electronic record keeping, health care documentation, standards, office filing, and specific areas of medicine of the teacher's discretion. Collaboration with local/regional health care businesses to provide students with Professional Learning Experiences (PLE) is advised.

36156 Certified Medication Aide [CMA] (.5 credit) - A program that prepares students to administer prescribed medications; observe and report patient reactions and side effects; and perform related emergency and recording duties under the supervision of an approved teacher, nurse or physician. This class includes instruction in basic anatomy and physiology, common medications and their effects, taking vital signs, oxygen administration, medication administration and application, record-keeping, and patient observation. This class results in the opportunity to test for KS certification in CMA.

36252 Biotechnology I B (1 credit) – Students will gain in-depth knowledge in the study of the bioprocesses of organisms, cells, and/or their components and enable them to use this knowledge to produce or refine products, procedures, and techniques. Course topics typically include laboratory measurement,

monitoring, and calculation; growth and reproduction; chemistry and biology of living systems; quantitative problem-solving; data acquisition and display; and ethics. Advanced topics may include elements of biochemistry, genetics, and protein purification techniques. Biotechnology has applications in four major industrial areas, including health care (medical), crop production and agriculture, non-food (industrial) uses of crops and other products (e.g. biodegradable plastics, vegetable oil, biofuels), and environmental uses.

36254 Special Health Science Topics B (.5 credit) - An in-depth look at a topic, area of research, occupation/career, technique or skill in the health science area, which has been selected by the teacher of record. Additional research and investigation into the topic, by students, should be included to show understanding and master of the knowledge gained. Students may further explore the special topic by collaborating, observing, and participating in approved activities with local and regional health care professionals to offer Professional Learning Experiences (PLE).

36991 Health Science III (1 credit) – Provides students with the extensive knowledge of health/wellness professionals in private/public industry, community organizations, and health care settings, as well as job opportunities, wage, and duties. Students will gain extensive knowledge in selected areas of health care, specific occupations, skills sets, educational requirements, credentials/licensure, and daily routines. This class includes instruction in specific skill sets related to health occupations, research on emerging trends, exploration of daily routines, understanding code of ethics, patient rights, standards and regulations, safety, and legal requirements. Collaboration with local healthcare professionals, organizations and businesses is encouraged to offer Professional Learning Experiences (PLE).

36992 Health Science IV [Shadow/Work] (1 credit) – Provides students with Professional Learning Experiences (PLE) to gain extensive knowledge of health/wellness professionals in private/public industry, community organizations, and health care settings, as well as job opportunities, wage, and duties. Students will gain extensive knowledge in selected areas of health care, specific occupations, skills sets, educational requirements, credentials/licensure, and daily routines by participating in Job Shadows or Internships. This class includes instruction in specific skill sets related to health occupations, research on emerging trends, exploration of daily routines, understanding code of ethics, patient rights, standards and regulations, safety, and legal requirements. Collaboration with local healthcare professionals, organizations and businesses is highly encouraged to offer PLE with documentation of the student experience.

36993 Health Science V [Shadow/Work] (2 credit) – Provides students with Professional Learning Experiences (PLE) to gain extensive knowledge of health/wellness professionals in private/public industry, community organizations, and health care settings, as well as job opportunities, wage, and duties. Students will gain extensive knowledge in selected areas of health care, specific occupations, skills sets, educational requirements, credentials/licensure, and daily routines by participating in Job Shadows or Internships. This class includes instruction in specific skill sets related to health occupations, research on emerging trends, exploration of daily routines, understanding code of ethics, patient rights, standards and regulations, safety, and legal requirements. Collaboration with local healthcare professionals, organizations and businesses is highly encouraged to offer PLE with documentation of the student experience.

44050 First Aid/CPR/EMR (.5 credit) - A technical level course designed to instruct students in the requirements and skills to obtain national certifications for First Aid, CPR and Emergency Medical Responder.

44060 Emergency Medical Technician [EMT] (.5 credit) - EMTs are clinicians, trained to respond quickly to emergency situations regarding medical issues, traumatic injuries and accident scenes. This class is designed to provide skills and knowledge necessary to sit for the EMT certification test. The class is taught by a certified EMT instructor and follows competencies set forth by the certifying agency.

44224 Forensic Science (.5 credit) - Forensic science is the scientific method of gathering and examining information about the past which is then used in a court of law. This application level course follows a background in biology and chemistry and provides students with a basic knowledge and skills needed to pursue postsecondary training in LPSS careers requiring Forensic Science (i.e., Forensic Anthropology, Forensic Medicine, and Medical Examiner). Areas of study may include deductive reasoning, toxicology, ballistics, anthropometry, fingerprints, maturation, DNA profiling, record keeping, research, mathematics, writing, and chemical interactions. Students will identify various careers related to forensic science, educational requirements, and certifications, credentials, or licensure needed.

44225 Forensic Science Comprehensive (1 credit) - Forensic science is the scientific method of gathering and examining information about the past which is then used in a court of law. This application level course follows a background in biology and chemistry and provides students with a basic knowledge and skills needed to pursue postsecondary training in LPSS careers requiring Forensic Science (i.e., Forensic Anthropology, Forensic Medicine, Medical Examiner). Areas of study may include deductive reasoning, toxicology, ballistics, anthropometry, fingerprints, maturation, DNA profiling, record keeping, research, mathematics, writing, and chemical interactions. Students will identify various careers related to forensic science, educational requirements, and certifications, credentials, or licensure needed.