

Health Science

An Introduction

The *Alabama Course of Study: Health Science* prescribes the required minimum content in the area of healthcare for students in Grades 9-12. This document, based on the National Health Care Skill Standards, identifies core knowledge and professional ethics essential to all healthcare learners/workers who pursue career paths in diagnostic, therapeutic, environmental, and/or informational services.

The purposes of the Health Science program are:

- To introduce students to the healthcare system
- To assist students in making realistic career decisions
- To develop students' leadership skills
- To prepare students for acceptance in postsecondary healthcare education programs and/or employment in healthcare jobs

For the United States to remain a world leader in the healthcare industry, students need to understand how biotechnology practices, procedures, and philosophies have evolved into current advanced technology and integrated delivery systems. Students also need to understand how this evolution has had an impact on current biotechnology practices. It is critical that students prepare for careers in health science to meet the increasing and changing demands of various populations and of the rapidly developing biomedical industry. Students in the Health Science program must achieve academic goals and meet the expectations of business and industry.

Health Science provides the flexibility for meeting the needs of all students in Alabama high schools. This cluster encompasses integrated academics and technology and includes a variety of course selections with materials relevant to the twenty-first century. The Health Science program emphasizes the importance of project, service, and work-based learning experiences. Development of leadership skills is enhanced through student participation in Health Occupations Students of America (HOSA). Optional learning opportunities include virtual classrooms and a virtual library. The rigorous and challenging content of the Health Science program lends itself to a variety of instructional strategies including contextual applications, multimedia, and cooperative learning. Health Science is competency-based, utilizing learner-centered instruction that provides opportunities for students to learn skills necessary for a career path in Health Science.

The curriculum creates a new model for Health Science. Not only does the content exceed business and industry standards, it also sets high expectations, provides clear objectives, and supports the concept that education involves more than simply teaching. The twenty-first century will bring with it a vast transformation, making many of today's jobs nonexistent. Although a variety of courses are offered to meet the individual needs of students, it may be necessary for local school systems to develop courses expanding the required Health Science curriculum to meet future demands for new jobs and new technologies. The Health Science curriculum provides a model for the design of locally developed courses, which must be approved by the State Department of Education prior to implementation.

Health Science

The Conceptual Framework

The innermost circle of the diagram represents the Health Science Cluster, surrounded by the curriculum core that signifies that Career/Technical standards common to all clusters are included in instruction. It is followed by a narrow circle that depicts the Kaleidoscope of Health Careers and Community Health, which are introductory courses. The cluster core circle, the Clinical Spectrum, surrounds it. The Clinical Spectrum includes the academic, technical, and workplace skills and knowledge that are common to the Health Science Cluster. The Clinical Spectrum leads to the next circle, which is divided into four clinical majors: Therapeutic Innovations, Dynamics of Diagnostics, Environmental Health, and Data Link. The next circle identifies possible representative health science careers/occupations related to each of the four clinical majors. The following circle identifies the one-half credit optional courses. The outermost circle shows examples of support courses (Related Other) that may enhance the Health Science curriculum.

Health Science Cluster

The Health Science Cluster of Career/Technical Education provides students with essential knowledge and skills for entering a clinical career tract. Optional courses are offered to allow students to explore careers and examine current issues in global healthcare delivery for all ages. Required courses (not depicted on the diagram) introduce concepts common to a variety of clinical disciplines and include understanding of professional behavior. Specialized courses beyond the required content allow students to participate in cooperative education programs or internships/preceptorships in their chosen areas of interest.

Kaleidoscope of Health Careers and Community Health

Introductory one-half credit courses beginning in Grade 9 or Grade 10 provide students with a general overview of clinical health sciences. Kaleidoscope of Health Careers introduces students to job opportunities, history, and trends in the area of Health Science. Community Health Issues provides students with the knowledge and skills regarding community and global health and well-being. These optional courses serve to stimulate further student interest in Health Science careers.

Clinical Spectrum

Clinical Spectrum is the course that provides students in Grades 9-12 with the content knowledge for all subsequent Health Science courses. Key concepts are (1) Academic Foundations, (2) Communications, (3) Employability Skills, (4) Legal Responsibilities, (5) Ethics, (6) Teamwork, (7) Health Systems Theory and Change, (8) Safety, and (9) Diversity. Skills and leadership potential also are developed through participation in Health Occupation Students of America (HOSA) activities at local, regional, state, and national levels. Successful completion of this course is based upon expected levels of content knowledge, skill performance, and demonstration of awareness of legal and ethical principles applicable to health science practice.

Clinical Majors

Students who have successfully completed the Clinical Spectrum course may rotate through one or more of the clinical majors of Dynamics of Diagnostics, Therapeutic Innovations, Environmental Health, and/or Data Link. Students majoring in Dynamics of Diagnostics or Therapeutics Innovations must take the Therapeutic Diagnostic Nucleus as a prerequisite. These majors prepare students to enter career tracts in Diagnostic, Therapeutic, Environmental, and/or Informational Health Science services. Students also may select one of the majors to pursue additional training during their senior year. Continued application of content standards with skill performance and legal/ethical awareness is required.

Health Science Continuum (Internship)/Cooperative Education (Optional)

Students completing the Career/Technical Education sequence of Clinical Spectrum and Clinical Majors are prepared for further education beyond the secondary level and/or employment immediately upon graduation. Students in Grade 12 have the opportunity to choose internships or cooperative education. Health Science services include Nursing, Pharmacy, Dentistry, Medicine, Veterinary Medicine, Nutrition, Sports Medicine, Emergency Medicine, Physical Therapy, Occupational Therapy, Respiratory Therapy, Radiology, Health Education, Health Information, Central Supply, Healthcare Administration, Medical Laboratory, Cardiovascular Services, Neurological Services, Biomedical Technology, Music/Art/Dance Therapy, Speech/Language Therapy, and others. Optional major electives are sports medicine aide, pharmacy technician, patient/client care technician, emergency medical technician, dental assistant, and medical assistant.

Additional Optional Courses for Health Science

Students may take optional courses in areas of their interest. These courses meet requirements of the Health Science cluster beyond the core courses of Clinical Spectrum and Clinical Majors. Optional courses are designed to interest students in contemporary topics in health science. They include Mental Health Issues, Children's Health Issues, Senior Health Issues, Drugs in Society, Consumer Health and Safety, and Health Speak.

Support Courses for Clinical Health Science Spectrum of Services

Students may take additional related coursework that supports a career in health science clinical services. These courses are drawn from advanced, basic and applied sciences, foreign languages, physical education, and technology education. Example support courses include anatomy, physiology, pathophysiology, geometry, physics, chemistry, advanced biology, psychology, sociology, speech, music/art, Spanish, Latin, business education, computer applications, environmental science, health education, accounting, and other career/technical electives.

KALEIDOSCOPE OF HEALTH CAREERS

Kaleidoscope of Health Careers is a one-half credit course that introduces students to the variety of helping professions in the health sciences. Students explore career possibilities including but not limited to physical therapy, emergency medical technology, respiratory therapy, environmental services, nursing, medicine, and multiple teaching strategies. Course content provides students with knowledge regarding the common skills and concepts, history and trends of healthcare delivery systems, job requirements and overviews, and possible job shadowing options in selected fields. Students build upon prior knowledge in the areas of English, mathematics, and science and use computer skills to locate Internet health resources.

Students will:

1. Evaluate health innovations and contemporary trends contributed by individuals both past and present.
Examples: innovations and trends—nurse practitioner, home-based medical care, home monitoring devices, organ transplants, genetic diagnosis, counseling individuals—Louis Pasteur, Alexander Fleming, George Washington Carver, Florence Nightingale, William Crawford Gorgas, David Satcher, Ida B. Moffett, Jean Kelley
2. Utilize Internet technology to locate resources in health matters.
 - PubMed, Medline Plus
 - Government resources
Examples: Library of Medicine, Center for Disease Control, National Institute of Health
 - Alabama Virtual Library
 - On-line health-related support groups
3. Appraise Internet resources for validity, accuracy, and applicability.
4. Describe basic concepts of healthcare opportunities.
 - Defining wellness and illness
 - Identifying types of healthcare delivery systems
5. Explore career opportunities in healthcare.
 - Therapeutic
 - Diagnostic
 - Informational
 - Environmental
6. Examine job outlooks and job availability in healthcare careers.
 - Types and levels of careers
 - Educational requirements
 - Salary ranges
 - Employability skills

7. Identify topics/issues related to health science and personal health.
 - Hand washing and health practices
 - Self-medication with over-the-counter agents
Examples: appropriate dosage, interactions, precautions, use
 - Utilization of health services

8. Explore the need for basic skills in first aid and community Cardiopulmonary Resuscitation (CPR).
 - Checking call care
 - Rescue breathing
 - Control bleeding
 - Bandaging/splinting
 - Performing CPR on adults, children, and infants
 - Automated External Defibrillator (AED)
 - Choking
 - Recognizing sudden illness
 - Recognizing specific injuries

COMMUNITY HEALTH

Community Health is a one-half credit course designed to enable students to develop a basic understanding of personal health and the health of the community. Healthcare interventions through the World Health Organization, medical missions, and governmental initiatives are explored through literature, current events, and political dynamics affecting the health of developed and developing countries. This course provides students with the basic knowledge necessary for success in the areas of community health and health careers.

Students will:

1. Apply the problem-solving process to design and implement a community health project.
 - Surveys
 - Community needs assessments
2. Demonstrate skills in Cardiopulmonary Resuscitation (CPR).
 - Performing CPR on adults, children, and infants
 - Choking
3. Demonstrate skills in first aid.
 - Assessing and notifying appropriate emergency personnel
 - Rescue breathing
 - Control bleeding
 - Bandaging/splinting
 - Automated External Defibrillator (AED)
 - Recognizing sudden illness
 - Recognizing specific injuries
4. Compare community health resources.
Example: Community Health Department
5. Analyze the influence of culture and the media on community health issues.
6. Research community health issues.
 - Drug and alcohol misuse and abuse
 - Abstinence and reproduction
 - Chronic and communicable diseases
 - Sexually transmitted diseases
 - Dental health
 - Nutrition
 - Accidents and safety
 - Family living
 - Personal health
 - Family violence

7. Analyze the effects of the environment on individual health.
8. Develop a health/wellness plan for an individual or group.
9. Research community health careers.
10. Identify emerging and re-emerging illnesses affecting the global community.
11. Relate developments in environmental safety to the health of society.
 - Air and water quality
 - Toxic waste disposal
12. Appraise the roles of public and private agencies in providing for international health.
 - World Health Organization
 - Medical missions
Example: church-sponsored
 - Private organizations
Example: Doctors without Borders
13. Assess initiatives that assist other nations to overcome a health crisis or problem.
14. Compare the differences in research priorities within the global community.
15. Predict future international health issues.
 - Disease
Example: anthrax
 - Warfare
Example: biological/chemical weapons
 - International adoption
 - Population growth and related shortages
Example: immunizations

CLINICAL SPECTRUM

Clinical Spectrum is a one- or two-credit foundational course that provides students with the opportunity to become competent healthcare workers. Integrated academics combined with healthcare knowledge and skills provide the framework for a strong healthcare delivery system in the twenty-first century. The two courses are Academic Foundations (one credit) and Advanced Academic Foundations (one credit). Academic Foundations is the prerequisite course for Advanced Academic Foundations. Students must earn a minimum of one credit in Clinical Spectrum before advancing to any of the courses in Clinical Majors.

Students will:

ACADEMIC FOUNDATIONS

Human Structure and Function

1. Describe the basic structure and function of cells, tissues, organs, and body systems.
2. Compare relationships among cells, tissues, organs, and body systems.
3. Explain body planes, directional terms, quadrants, and cavities.
4. Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and rehabilitation.
5. Annotate deciduous and permanent teeth using the Universal Method.
6. Assess personal health practices that affect the optimal function of each of the major body systems.

Growth and Development

7. Employ principles of growth and development in assessing health status.
8. Compare differences in human responses to wellness and illness, which is a function of age.
Examples: infant dependence; school-age child's learning and performance; adolescent's role relationships; adult's establishing of family, home, and work; elderly person's preservation of dignity and worth, independence, and death and dying
9. Prepare age-appropriate materials for use in teaching.
Examples: diet management for a diabetic child, avoidance of smoking in pregnant teen, hypertension management in adult, pain management in older adult, behavior modification

Mathematical Skills

10. Utilize mathematical skills to construct and analyze graphs, charts, and tables.
11. Contrast measurements of time, temperature, weight, distance, and height.
12. Demonstrate the ability to compare and convert measurements of traditional units.
 - Apothecary
 - Household
 - Metric
 - Computation of medication dosage

Medical Language

13. Explain medical symbols, abbreviations, and terminology usage.
Examples: Health Occupation Students of America (HOSA), medical and dental terminology
14. Utilize correct spelling, pronunciation, and usage of technical terms.
15. Interpret prescriptions and physicians' notes and orders.
16. Report observations and findings using accurate medical terminology and following legal guidelines.
Examples: verbal, written

Communication Skills

17. Adjust communication to others' ability to understand.
18. Apply elements of communication using the sender-receiver model.
19. Apply active listening skills using reflection, restatement, and clarification techniques.
20. Demonstrate courtesy to others including self-introduction.
21. Interpret verbal and nonverbal behaviors to augment communication within scope of practice.
22. Demonstrate interviewing skills.
23. Report relevant information in order of occurrence.
24. Report subjective and objective information.
25. Demonstrate the ability to efficiently organize, write, and compile technical information and summaries.
26. Demonstrate the ability to accurately interpret, transcribe, and communicate information, data, and observations.

27. Use communication technology to access and distribute data and other information.
Examples: facsimile, E-mail, Internet, slide presentations

Legal Responsibilities

28. Define the legal aspects of patient/client care.
Examples: confidentiality, assault, battery, defamation, false imprisonment, fraud, invasion of privacy, consent, negligence, malpractice, misdemeanor, felony, liability, privileged communication
29. Relate the Patient's Bill of Rights to quality healthcare.
30. Analyze legal requirements in documentation.
Examples: errors, omissions
31. Relate standard of care to provision of services.
- Licensure and certification
 - Accreditation
 - Reasonable person standard
 - Malpractice and liability
32. Assess the role of quality assurance in the healthcare delivery system.

Ethics

33. Determine ethical issues dealing with professional rights and responsibilities.
Examples: abortion, cloning, euthanasia
34. Evaluate accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.
Examples: birth control, death and dying, blood transfusions
35. Analyze activities that adversely affect the health, safety, or welfare of patients/clients.
36. Define ethics as it relates to health science professions.
37. Interpret a code of ethics.
38. Explain ethical responsibilities dealing with advertising, telecommunications, media, and confidentiality.
39. Identify new and emerging technology that may affect health.
Examples: artificial insemination, cloning
40. Recognize human dilemmas that result from new technologies.
Example: positive and negative results
41. Relate the history of bioethics including human subject protection and legislation supporting ethical applications in health sciences.

42. Hypothesize the future of genetic research.
43. Propose standards for use of investigational drugs and therapies.
44. Interpret current and potential techniques for reproductive technology.
Example: ultrasound

Employability Skills

45. Practice personal integrity and honesty.
46. Adopt personal appearance and hygiene habits appropriate to the healthcare environment and industry expectations.
47. Adapt positively to the dynamics of change.
48. Maintain employability skills that promote employment opportunities and career growth.
49. Evaluate work assignments and initiate action with confidence commensurate with own work assignment.
50. Formulate solutions to problems using critical-thinking skills (analyze, synthesize, evaluate) independently and in teams.
51. Interact appropriately and respectfully with diverse ethnic, age, cultural, religious, and economic groups in various employment and social situations.
52. Exhibit respectful and empathetic behavior when interacting with peers-superiors, subordinates, and customers in one-on-one and group situations.
53. Follow attendance policies of the employer or educational institution.
Example: accepting responsibility for own actions
54. Communicate in a straightforward, understandable, accurate, and timely manner.
55. Provide written communication that is accurate and grammatically correct using nomenclature appropriate to the healthcare environment.
56. Interpret technical materials used in healthcare practices and procedures.
57. Engage in continuous self-assessment and goals modification for personal and professional growth.
58. Demonstrate the ability to manage time, prioritize responsibilities, and meet completion dates as specified by employer and patient/client.
59. Demonstrate enthusiasm and commitment by adhering to company expectations and priorities.
60. Explore a potential health science career path in at least one of the following healthcare services: diagnostic, therapeutic, information, or environmental.

61. Evaluate levels of education, credentialing requirements, employment opportunities, workplace environments, and career growth potential for the service area.
62. Demonstrate the ability to utilize computer technology.

Safety

63. Analyze various situations to document and correct safety risks.
 - Human error
 - Environmental risks
 - Attitudes
64. Practice principles of ergonomics.
65. Apply principles of body mechanics including proper lifting techniques, positioning, moving, and transferring.
66. Employ emergency procedures and protocols regarding fire, electrical hazards, and hazardous materials using healthcare guidelines such as Occupational Safety and Health Administration (OSHA) standards.
67. Apply standard precautions and OSHA standards to control the spread of infection including aseptic techniques.
 - Hand washing
 - Personal protective equipment
 - Isolation
68. Demonstrate cleaning methods for instruments, equipment, and environmental surfaces.
Examples: soap and water, chlorine bleach, ultrasonic cleaner
69. Demonstrate principles of first aid application in emergency conditions.
 - Bleeding
 - Shock
 - Poisoning
 - Burns
 - Heat and cold exposures
 - Muscular/skeletal injuries
 - Sudden illness
70. Demonstrate cardiopulmonary resuscitation emergency procedures including obstructed airway procedures.

Healthcare Team Diversity

71. Investigate the multiple factors producing diversity in the healthcare team and clientele including ways these factors influence health and healthcare delivery.
72. Demonstrate respect for the worth of each individual.

73. Assess worth, potential, work, and accomplishments of each patient/client and health team member.
74. Compare individual differences among healthcare team members that help to define each person's uniqueness.
75. Select ways of interacting with other healthcare members that facilitate optimal teamwork and function.
76. Analyze the strengths and weaknesses of a team and work to provide optimal function in the delivery of healthcare services.

ADVANCED ACADEMIC FOUNDATIONS

Diseases and Disorders

1. Compare selected diseases and disorders including respective classification(s), causes, diagnoses, therapies, and care rehabilitation to include biotechnological applications.
2. Classify microorganisms.
3. Differentiate among pathogenic and nonpathogenic microorganisms.
4. Analyze methods to control the spread of pathogenic microorganisms.
5. Contrast the various types of immunities.
6. Analyze body system changes in regard to diseases, disorders, and wellness.
7. Describe the relationship of the physical, mental, emotional, social, and spiritual components of wellness.
8. Compare the aging process among the body systems.

Healthcare Delivery System

9. Construct a healthcare delivery system model.
10. Predict how factors such as cost, managed care, technology, an aging population, access to care, alternative therapies, and lifestyle/behavior changes may affect various healthcare delivery system models.
11. Calculate the cost effectiveness of two separate healthcare delivery systems using the same patient/client procedure.

Healthcare Teams

12. Practice the team concept in providing quality patient/client care.
13. Examine characteristics of effective teams.
14. Analyze roles of various team participants.
Examples: team leader, team member
15. Respond appropriately to critical situations as a member of a team.
Example: CPR

Team Member Participation

16. Communicate verbally and nonverbally with team colleagues to assure the best result for the patient/client.
17. Collaborate with others to formulate team objectives.
18. Demonstrate team-member responsibility by completing assigned tasks in a timely and effective manner.
19. Utilize leadership skills as appropriate.
20. Demonstrate respect for the expertise and contributions of all team members.
21. Work collaboratively with persons from diverse backgrounds to accomplish a common goal.
22. Utilize appropriate corrective action when dealing with conflict.
23. Exhibit a strong sense of team identity and commitment to purpose.

Healthcare Delivery System Results

24. Diagram the interdependence of healthcare professions within a given healthcare delivery system pertaining to the delivery of quality healthcare.
25. Design a system analysis process that evaluates patient/client satisfaction, productivity, cost effectiveness, and efficiency.
26. Evaluate the impact of enhanced technology on the healthcare delivery system.

Differences in Religion and Ethnicity

27. Discuss contributions that religion makes to a person's overall health and life activities.
28. Compare basic beliefs and customs of the major religions.
Examples: Judaism, Christianity, Muslim, Eastern Religions

29. Utilize library and Internet resources to locate information on religious practices and customs.
30. Define ethnicity.
31. Illustrate how ethnicity does and does not affect who we are, what we do, and our health and healthcare.
32. Appraise the role of ethnicity in a patient's/client's health status.
33. Specify techniques a healthcare provider may use to deliver culturally competent care.
Examples: listening, health history of significant variables, exploration of effects of religion and ethnicity on patient/client, communication skills, resource utilization (translation)
34. Use religious/ethnic resources to assist patients/clients to achieve optimal health.
35. Distinguish among biological, psychological, and social factors affecting patient/client health.
36. Discuss how religion and ethnicity may affect biological, psychological, and social factors.

Gender and Sexuality

37. Assess the roles of gender and sexuality in contemporary society to include roles that are changing and roles that show continuity over time.
38. Discuss sexual harassment in the work place.
39. Identify techniques of healthcare service delivery that support appropriate mixed gender interaction.
Examples: addressing as Mr., Ms., Mrs.; utilization of same sex attendant; legal chaperones

Disabilities

40. Define concepts of ability, disability, and impairment.
 - Cognitive
 - Behavioral
41. Determine appropriate communications for addressing a disabled person.
Examples: using formal titles (Mr., Mrs., Ms.), avoiding child talk, assuming competence
42. Illustrate accomplishments of disabled persons recognized by society.
Examples: Special Olympics; celebrities with disabilities – Heather Whitestone, Stevie Wonder, Franklin Delano Roosevelt, Wilma Rudolph, Lance Armstrong, Helen Keller
43. Specify personal and societal resources to assist disabled patients/clients to reach their full potential.

44. Relate wellness to disabilities.
45. Discuss ways the Internet can be used by disabled individuals to extend their abilities.

System Change

46. Analyze the outcomes of change to the healthcare system based on the influence of technology, epidemiology, bioethics, socioeconomic conditions, and various forms of alternative medicines.

THERAPEUTIC INNOVATIONS AND DYNAMICS OF DIAGNOSTICS NUCLEUS

Therapeutic Innovations and Dynamics of Diagnostics Nucleus is a one-credit core course designed to introduce students to these two areas of healthcare. This prerequisite introductory course enables students to make choices regarding the appropriate career pathway: Therapeutic Innovations and/or Dynamics of Diagnostics.

Students will:

Intra-Team Communication

1. Apply basic listening skills in a laboratory and/or clinical setting.
2. Develop basic observational skills and related documentation strategies in written and oral form.
3. Utilize characteristics of successful communication.
4. Demonstrate the importance of courtesy and respect for individuals.
5. Distinguish between factual reports and personal opinion in clinical situations.
6. Utilize the flow of communication through the chain of command.
7. Choose ways of interacting with other healthcare members that facilitate optimal teamwork and function.
8. Practice a code of professional ethics.
9. Interpret medical orders and their implications for patient/client care.

Monitoring Patient/Client Status

10. Assess patient/client vital signs.
 - Temperature
 - Pulse
 - Respiration
 - Blood pressure
 - Pain
11. Explain the effects of disease and disorders on health status.
12. Organize patient/client environment for infection control and patient/client safety.
13. Practice taking patient/client height and weight.
14. Assess fluid intake and urine output.

15. Demonstrate basic neurological exams.
Example: reflex responses
16. Recognize patient/client progression toward health improvement.
17. Evaluate the effects of therapeutic and diagnostic agents on the human body.
Example: hot and cold applications
18. Describe the procedures to properly identify patient/client.
19. Assess nutrition and hydration.

Patient/Client Movement

20. Define procedures for the safe transport and transfer of patient/client.
21. Demonstrate fire safety and evacuation procedures.
22. Demonstrate the proper procedures for lifting and moving patient/client.
23. Explain planned movement to elicit patient/client cooperation.

Patient/Client Interaction

24. Utilize the Patient's Bill of Rights in patient/client care situations.
25. Practice a Code of Ethics consistent with the healthcare occupation.
26. Maintain confidentiality.
27. Distinguish among responsibilities of various healthcare workers in patient/client interactions.
28. Demonstrate respect by healthcare workers in patient/client interactions.

Health Maintenance Practice/Screening Practices

29. Evaluate personal health maintenance practices.
30. Assess patient/client health maintenance status.
 - Vision
 - Hearing
 - Blood glucose
 - Scoliosis
 - Nutritional status
 - Body mass index
 - Oral health
31. Practice healthy behaviors.
Examples: good nutrition, physical fitness, abstinence
32. Teach healthy behaviors to patients/clients of various ages in community settings.

THERAPEUTIC INNOVATIONS

Therapeutic Innovations is a one-half credit course that introduces students to occupations or functions primarily involved in changing the health status of the patient/client over time. Course content specifies core knowledge and skills needed by workers in the therapeutic cluster. Therapeutic Innovations includes the areas of nursing, sports medicine, medicine, therapy, dentistry, pharmacy, and others. Upon successful completion of the course, students may choose to continue studies in Health Science Continuum or Cooperative Education. Therapeutic/Diagnostic Nucleus is the prerequisite course for Therapeutic Innovations.

Students will:

Data Collection

1. Utilize agency policies and procedures for data collections.
Example: admission
2. Obtain data and report results.
Example: family history
3. Explain procedures used by healthcare teams in diagnosing patient/client health status.

Treatment Planning

4. Utilize appropriate agency resources for planning care.
5. Analyze the relationship of patient/client/family in setting treatment goals.
6. Assess the importance of planning intervention with economy of time and resources.
7. Analyze the role of therapeutic interventions including pharmacologic interventions in meeting patient/client healthcare needs.
8. Chart anatomical and tooth defects on a dental diagram.
9. Identify dental/medical instruments.
10. Perform dental/medical procedure tray setups.
Examples: basic setup, amalgam setup, composite/resin setup, surgical setup, basic sterile setup, catheterization setup, suture setup and removal

Implementing Procedures

11. Explain procedures for attending to a variety of patient/client needs.
Examples: hygiene, first aid, diet, medication

12. Demonstrate appropriate hygienic care.
 - Bath, skin, and perineal care
 - Oral hygiene
 - Elimination assistance
 - Grooming
 - Feeding
 - Dressing
13. Assist with ambulation, positioning, turning, transferring, and range of motion.
Example: restoration program
14. Assist with respiratory function.
 - Turning, coughing, taking a deep breath
 - Vibro-percussion
 - Incentive spirometry
15. Assist with skin care need.
Examples: massage, prevention of skin breakdown, maintenance of hydration, bed-making, back rub
16. Implement required first aid.
 - Calling for assistance
 - Treating for shock
 - Immobilization of injury
 - Caring for injury
 - Foreign Body Airway Obstruction (FBAO)
 - Cardiopulmonary resuscitation
 - Automatic electronic defibrillator
17. Assist with maintenance of therapeutic diets.
Examples: verification of diet, food choices, recording of intake, diet teaching, feeding
18. Calculate medication dosages safely and accurately.
19. Dispense/administer medications safely in artificial laboratory settings.
 - Right patient
 - Right medication
 - Right dose
 - Right route
 - Right time

Patient/Client Status Evaluation

20. Perform an initial assessment in a laboratory/clinical setting.
21. Analyze changes occurring since the initial assessment.
Example: abnormal versus normal
22. Compare patient/client progress to patient/client goals.
23. Inventory contributing factors to patient/client outcome.
24. Communicate with other healthcare team members to modify treatment plan in accordance with patient/client needs and abilities.

DYNAMICS OF DIAGNOSTICS

Dynamics of Diagnostics is a one-half credit course that provides students with an understanding of diagnostic services. Diagnostic services create a picture of a patient/client health status at a single point in time. Dynamics of Diagnostics includes the areas of laboratory science, radiology (X-ray), sonography, CAT scan, electrocardiogram, and others. Upon successful completion of the course, students may choose to continue studies in Health Science Continuum or Cooperative Education. Therapeutic/Diagnostic Nucleus is the prerequisite course for Therapeutic Innovations.

Students will:

Planning

1. Differentiate between invasive and noninvasive procedures.
2. Distinguish among clean, aseptic, and sterile procedures.
3. Integrate patient/client factors for planning diagnostic procedures.
Examples: language barriers, special needs

Preparation

4. Explain procedures to patient/client.
5. Prepare for procedures with economy of time and resources.

Procedure

6. Interpret an imaging diagnostic request.
 - Selecting appropriate equipment
 - Identifying basic anatomy on the resulting image
7. Perform an electrocardiogram.
8. Distinguish among sinus, atria, and ventricular rhythms.
9. Assess cardiac output and tissue perfusion.
Example: nail blanching
10. Perform proper procedures for collecting, labeling, and processing artificial samples of body fluids and tissues for laboratory assessments.
Examples: hematocrit, hemoglobin, microbiological cultures of person and environment, blood typing, glucose testing (urine and blood), visual screening of blood sample under microscope
11. Interpret an optical prescription.

Evaluation

12. Monitor patient/client response to diagnostic procedures.
13. Modify plans as needed to protect patient/client safety or comfort.
14. Interpret the implications of findings on the patient/client and the patient/client response to the findings of diagnostic tests.

Reporting

15. Practice within the legal framework of the healthcare diagnostics occupations.
16. Defend the importance of the medical liability of healthcare workers.
17. Report and document per facility protocol in a timely, accurate manner.

ENVIRONMENTAL HEALTH

Environmental Health is a one-credit course that provides students with information regarding occupations or functions involving direct or indirect patient/client care that creates a therapeutic environment for providing that care. Course content specifies core knowledge and skills needed by workers in the environmental services cluster. Environmental Health addresses the areas of public health, sanitation, epidemiology, vector control, and others. Upon successful completion of the course, students may choose to continue studies in Health Science Continuum or Cooperative Education. A minimum of one credit in Clinical Spectrum is the prerequisite for Environmental Health.

Students will:

Operations

1. Specify the basic components of the healthcare delivery system.
2. Describe the composition and functions of a healthcare team.
3. Determine the relationship of legislation to the health of the individual and community.
4. Research various types of environmental healthcare providers and the services they provide.
Examples: OSHA, Public Health Department
5. Determine the general roles and responsibilities of the individual members of the environmental healthcare team.
6. Utilize policies and procedures in performing an assigned role.
7. Investigate environmental trends affecting the delivery of healthcare and analyze how these changes have affected the healthcare provided to individuals.

Aseptic Procedures

8. Distinguish between fact and fallacy about the transmission and treatment of diseases caused by blood-borne pathogens.
9. Identify community resources and services available to individuals with blood-borne pathogens.
10. Identify “at risk” behaviors that promote the spread of diseases caused by pathogenic organisms and the public education necessary to combat the spread of these diseases.
11. Relate infection control techniques designed to prevent the spread of diseases caused by pathogenic organisms to the care of all patients/clients following Centers for Disease Control (CDC) guidelines.
12. Explain what is meant by standard precautions.
13. Recognize the importance of and demonstrate how to properly clean medical/dental equipment.
Examples: dental chair, dental unit, hospital bed, wheel chair, over-bed table

14. Distinguish between medical/dental and surgical asepsis.
15. Demonstrate how to dispose of biohazard materials according to appropriate government guidelines.
Example: Occupational Safety and Health Administration (OSHA)
16. Demonstrate how to read Material Safety Data Sheets (MSDS).

Resource Management

17. Describe how to properly care for equipment and supplies.
18. Define the term “loss prevention” and describe why this is important to environmental personnel.
19. Recognize the importance of reporting potential and actual safety hazards.
20. Interpret statistical data related to surveillance reports and recognize the importance of reporting trends.

Aesthetics

21. Explain the meaning of the term “milieu” and how the milieu affects the health of an individual.
22. Compare the importance of servicing versus replacing equipment on a rotating basis.
23. Comprehend why it is economical to perform preventive maintenance on equipment.

DATA LINK

Data Link is a one-credit course that provides students with information regarding occupations or functions that document patient/client care. Course content specifies core knowledge and skills needed by workers in the information services career path. Data Link addresses the areas of medical transcription, health educator, medical librarian, medical records technician, and others. Upon successful completion of the course, students may choose to continue studies in Health Science Continuum or Cooperative Education. A minimum of one credit in Clinical Spectrum is the prerequisite for Data Link.

Students will:

Analysis

1. Evaluate patient/client charts, reports, and insurance forms.
2. Perform mathematical functions.
3. Use medical/health terminology.
Examples: compiling healthcare statistics, tabulating budgetary factors

Abstracting and Coding

4. Specify key elements required in medical/health records.
5. Research and evaluate malpractice and liability issues.
6. Demonstrate and utilize patient/client confidentiality.
7. Comply with legal requirements for documentation.
8. Perform assigned duties in accordance to laws, regulations, policies, and legislated rights/responsibilities of patients/clients.

Systems Procedures

9. Identify basic information sources.
Examples: admission forms, insurance forms
10. Demonstrate the ability to sign on and off automated systems and/or programs.
11. Utilize filing, storage, and retrieval systems.
12. Ensure data security and confidentiality by controlling access and release of information.
13. Discuss malpractice and liability issues.

Operations

14. Complete various forms using appropriate medical/health terminology.
15. Use specific guidelines and methods of sending and receiving information according to facility regulations.
16. Utilize electronically produced information.

Documentation

17. Locate information in various record formats.
18. Convert narrative information into a statistical data format.
19. Assemble patient/client record in correct format.
20. Demonstrate appropriate procedure and diagnostic codes manually and electronically.

OPTIONAL COURSES

HEALTH SPEAK

Health Speak is a one-half credit course that enables students to utilize the Internet and other technology resources to learn a new language that acquaints them with a variety of topics related to Health Science. Students demonstrate mastery of terms related to health awareness, health practice, and health careers through knowledge gained in the areas of anatomy, physiology, microbiology, and pathophysiology.

Students will:

1. Identify components of medical/health terminology.
 - Prefix
 - Suffix
 - Root word
2. Use prefixes, suffixes, and root words to diagram and interpret the meaning of words.
3. Utilize appropriate medical/health terms to describe basic body systems.
Examples: muscular, skeletal, nervous, circulatory
4. Relate medical terms to basic terms from biology courses including anatomy and physiology, pathophysiology, and microbiology.
5. Combine medical/health terminology components to describe variations in physiology.
6. Critique information found on Internet health resources.
7. Interpret physicians' prescriptions, notes, and orders.
8. Demonstrate oral and written use of medical/health terms.
9. Compare normal and abnormal physiology status.
10. Demonstrate knowledge of the normal body defenses against disease processes.
Examples: white blood count (WBC), antibodies
11. Recognize the effects of abnormal factors such as immobility, stress, pain, substance abuse, and environmental hazards on normal functioning of the body.
12. Interrelate physiology and clinical manifestations for various diseases.
13. Locate current research related to diagnosing and treating diseases.
14. Analyze current statistics related to diseases within community, state, and nation.
15. Interpret the relationship among local, national, and international disease statistics.

DRUGS IN SOCIETY

Drugs in Society is a one-half credit course that introduces students to issues regarding drugs as they impact health and lifestyles. Topics addressed include legal and illegal use of drugs, lifesaving treatments of pharmaceutical agents, and the role of concerned citizens in drug legislation and drug education.

Students will:

1. Differentiate among classifications of drugs.
2. Differentiate the positive and negative effects of drugs.
3. Recognize possible effects of overdosing and underdosing.
4. Discuss drug withdrawal.
5. Differentiate among prescriptions and “street” or illegally available drugs.
6. Discuss drug dependence, addiction, and impairment.
7. Compare treatment options.
8. Analyze the influence of culture and the media on the use of drugs.
9. Discuss the use of tobacco.
10. Identify the effects of tobacco.
11. Distinguish among types of tobacco products.
12. Relate the use of drugs and tobacco to chronic illnesses such as lung disease, cirrhosis, hypertension, and ulcers.
13. Discuss drug-drug and drug-food interactions.
14. Discuss the role of drug legislation in providing for safe drug use in society.
15. Generate a plan for safe home medication use.
 - Label reading
 - Dosage instructions
 - Proper storage and disposal
16. Interpret patient education package inserts.
 - Prescriptions
 - Over-the-counter medications

CHILDREN'S HEALTH ISSUES

Children's Health Issues is a one-half credit course that allows students to identify specific needs relative to the growth and development of children. Effects of child health on lifetime health are explored together with the roles of parents, educators, and society with respect to child health insurance coverage and care available in both rural and urban locales.

Students will:

1. Describe the normal phases of childhood growth and development.
 - Newborn/infant
 - Toddler
 - Preschooler
 - School-age child
 - Adolescent
2. Rank children's needs on Maslow's hierarchy of needs.
 - Psychological
 - Love and affection
3. Discuss the role and relationship of children to others.
 - Parent
 - Sibling
 - School-age peer
 - Teacher/coach
4. Discuss implications of abuse on child health and development.
Examples: physical, sexual, mental, verbal
5. Specify health needs of children in different settings.
Examples: home, school, daycare, community, camps, extracurricular activities
6. Research common health problems of infants, children, and adolescents.
7. Recognize the relative priority of injury prevention in child health.
8. Select best practices within child health and accident prevention areas.
 - Seat belt use
 - Helmets and other safety equipment
 - Immunizations
 - Well-child health maintenance
9. Analyze costs and benefits of accessibility to healthcare for children.
 - Insurance
Example: Children's Health Insurance Program (CHIP)
 - Primary resources (rural and urban)
 - Secondary and tertiary resources
10. Describe a diet for a healthy child incorporating age-appropriate food preferences and recommended nutritional allowances.

SENIOR HEALTH ISSUES

Senior Health Issues is a one-half credit course that allows students to examine lifestyles of retired active seniors in the areas of exercise, nutrition, socialization, and community participation. Pharmaceutical and healthcare needs of elderly persons reaching the age of 80 and beyond are the focus of this course. Consumer issues, economics, and health insurance coverage for major illnesses are explored together with caregiver needs and options for the elderly with significant illnesses.

Students will:

1. Provide correct information regarding common fallacies associated with aging.
 - Cognitive impairment
 - Living in poverty
 - Unhappy and lonely
 - Physical
 - Psychological
2. Recognize expected health changes associated with normal aging including preparation for the end of life.
3. Identify changing safety needs for aging individuals.
4. Encourage healthy practices for active lifestyles.
 - Nutrition
 - Exercise
 - Social activity
 - Community participation
5. Describe the barriers to healthy practices for seniors.
6. Select a meal plan for an elderly person on a regular and on a modified (low sodium, low sugar) diet.
7. Distinguish between chronic conditions and terminal illnesses in the elderly.
8. Analyze pharmaceutical hazards for seniors.
 - Dosing
 - Caution
 - Interaction
9. Describe basic restoration services.
 - Resident tasks based on ability
 - Assistive devices
 - Range of motion
 - Positioning and turning devices
 - Bowel and bladder training
 - Prosthetic and orthotic devices

CONSUMER HEALTH AND SAFETY

Consumer Health and Safety is a one-half credit course that enables students to explore information sources such as Medline Plus, governmental and nongovernmental sites, list serve groups, and E-mail groups. Health information provided by healthcare providers for alternative therapies and natural remedies is explored and evaluated including cost of healthcare treatment and best use of the consumer's health dollar.

Students will:

1. Prioritize health teaching needs.
Examples: diet, exercise
2. Defend the impact of global information sources on present and future society.
Examples: Internet, television news broadcasts
3. Compare traditional sources of health and safety information to current sources.
4. Relate the use of alternative therapies and natural remedies to availability of optional sources of information.
5. Critique information from health resources for consumers on the Internet according to factual basis and point of view.
 - Accessibility
 - Reliability
6. Assess reliability of health and safety resources on the Internet as it relates to consumer behavior.
Example: prescription drugs
7. Rank Internet sources of information with more traditional sources.
8. Differentiate between general recommendations available through public forums and specific health recommendations provided by physicians and practitioners for patients/clients.
 - Prioritizing information
 - Ranking sources
9. Organize sources of health and safety information from broad to specific.
10. Utilize resources from the Internet, library, and community agencies to determine a health-teaching project.
11. Select a health-teaching project.
12. Implement a health-teaching project.
13. Analyze results of a health-teaching project.

MENTAL HEALTH ISSUES ACROSS THE LIFE SPAN

Mental Health Issues Across the Life Span is a one-half credit course that introduces students to a range of mental health issues from handicapping conditions of childhood to depression to caring for an aging parent with cognitive defects. This course focuses on the coping, surviving, and thriving strategies utilized by persons experiencing these situations. Resources for strengthening relationships, networking with others, and allocating resources equitably are addressed through the content of this course. Human dimensions of mental health concerns and society's response to these concerns are also components of this course.

Students will:

1. Describe the effect of mental health as an important aspect of overall health.
2. Describe mental health concepts common to all ages.
Examples: developmental issues, temporary anxiety, social support
3. Define major mental health problems.
 - Depression
 - Personality disorders
 - Schizophrenia
 - Paranoia
 - Obsession/compulsion
 - Eating disorders
4. Describe the effects of mental health problems on the client, family members, and society.
5. Recognize common coping strategies used by individuals and families not experiencing mental health difficulties.
Example: defense mechanisms
6. Compare coping strategies of individuals and families experiencing mental health difficulties with those not experiencing mental health difficulties.
7. Utilize available resources in the management and improvement of mental health conditions.
8. Classify resources as to accessibility and cost.
9. Summarize an historical perspective of mental health.
10. Judge relative contributions of philosophy, religion, ethics, psychology, literature, and science to the understanding of human dimensions of mental health.
11. Describe recent changes in the management and treatment of mental illness.

HEALTH SCIENCE CONTINUUM (INTERNSHIP)

Health Science Continuum (Internship), an accelerated program of study, is a two-credit course offered to students who have completed a clinical major and have a health career objective leading to immediate employment or postsecondary study. Clinical assignments comprise at least 60 percent of the Health Science Internship course. Course content, delivered primarily through individualized study, includes career-related skills, healthcare systems, communication, emergency skills, and pharmacology. Internships focus on specific healthcare professions. The prerequisite is a minimum of one credit in Clinical Spectrum, or one credit in Clinical Majors, or three credits in biology, advanced biology, chemistry, or physics.

Students will:

1. Perform entry-level healthcare skills from a clinical major.
2. Exhibit skills for healthcare employment.
Examples: professional conduct and appearance, interpersonal skills, team membership skills
3. Practice legal and ethical behaviors.
Examples: standards for healthcare practice, confidentiality, patient rights, personal ethics
4. Describe healthcare delivery and financing.
5. Use medical abbreviations and terminology.
6. Communicate within the healthcare system physician's orders.
Example: patient records
7. Use electronic methods of communication.
8. Complete CPR certification.
9. Analyze medications using medical references.
Examples: classifications, indications, contraindications, side effects, recommended dosages
10. Perform healthcare skills in a clinical agency.
Example: internship

HEALTH SCIENCE CLUSTER CROSSWALK

Subject Area	Grade 9/10	Grade 10/11	Grade 11/12	Grade 11/12	Optional Courses	Career Opportunities**
English (4 credits) Math (4 credits) Science (4 credits) Social Studies (4 credits) *Arts Education (1/2 credit) Technology (1 credit) *Physical Education (1 credit) *Foreign Language (2 credits) Health Science Required Pathway	English Math Science Social Studies *Arts Education	English Math Science Social Studies *Arts Education	English Math Science Social Studies *Arts Education	English Math Science Social Studies *Arts Education	Introductory Courses Prerequisite: None Grades 9-10 Kaleidoscope of Health Careers (1/2 credit—may be paired with Community Health Issues or other 1/2 credit course for total of 1 credit) Community Health (1/2 credit—may be paired with Kaleidoscope of Health Careers Issues or other 1/2 credit course for total of 1 credit) Contemporary Topics Prerequisite: None Grades 9-12 Health Speak (1/2 credit) Drugs in Society (1/2 credit) Consumer Health and Safety (1/2 credit) Children's Health Issues (1/2 credit) Senior Health Issues (1/2 credit) Mental Health Issues (1/2 credit) (Any two of these courses may be paired to earn 1 credit.)	Medical Doctor Dentist Pharmacist Veterinarian Biomedical Engineer Registered Nurse Physical Therapist Occupational Therapist Radiologist Respiratory Therapist Laboratory Technician Healthcare Administrator Biomedical Engineer Pharmacy Technician Medical Records Technician Licensed Practical Nurse Surgical Technician Dental Assistant Patient Care Technician Nurse Assistant Emergency Medical Technician Nutritionist Epidemiologist Vector Technician Mortician
	Computer Applications *Physical Education *Foreign Language	Clinical Spectrum (1 or 2 credits) Clinical Spectrum Academic Foundations (1 credit) Advanced Academic Foundations (1 credit) Prerequisite: Academic Foundations	Clinical Majors (Select one or more, 1-2 credits total) Prerequisite: 1 credit in Clinical Spectrum Therapeutic/Diagnostic Nucleus (1 credit) Required for either Therapeutic or Diagnostic Nucleus Therapeutic Innovations (1/2 credit) Prerequisite: Therapeutic/Diagnostic Nucleus Environmental Health (1 credit)	Health Science Continuum (Internship) (2 credits) Prerequisite: 1 credit in Clinical Majors, or 1 credit in Clinical Spectrum, or 3 credits in biology, advanced biology, chemistry, or physics Optional Contemporary Topics Courses		
Courses	Optional Introductory Courses	Academic Foundations (1 credit) Advanced Academic Foundations (1 credit) Prerequisite: Academic Foundations	Therapeutic/Diagnostic Nucleus (1 credit) Required for either Therapeutic or Diagnostic Nucleus Therapeutic Innovations (1/2 credit) Prerequisite: Therapeutic/Diagnostic Nucleus Environmental Health (1 credit)	Therapeutic/Diagnostic Nucleus (1 credit) Required for either Therapeutic or Diagnostic Nucleus Dynamics of Diagnostics (1/2 credit) Prerequisite: Therapeutic/Diagnostic Nucleus Data Link (1 credit)	Health Speak (1/2 credit) Drugs in Society (1/2 credit) Consumer Health and Safety (1/2 credit) Children's Health Issues (1/2 credit) Senior Health Issues (1/2 credit) Mental Health Issues (1/2 credit) (Any two of these courses may be paired to earn 1 credit.)	Medical Doctor Dentist Pharmacist Veterinarian Biomedical Engineer Registered Nurse Physical Therapist Occupational Therapist Radiologist Respiratory Therapist Laboratory Technician Healthcare Administrator Biomedical Engineer Pharmacy Technician Medical Records Technician Licensed Practical Nurse Surgical Technician Dental Assistant Patient Care Technician Nurse Assistant Emergency Medical Technician Nutritionist Epidemiologist Vector Technician Mortician
Work-Based Learning and Service	Tours of Medical Facilities	Job Shadowing	Clinical Internships	Internships and Cooperative Education		
Service-Based Learning	Community-Based Projects					

*The one-half credit in Arts Education and the one credit in P.E. may be taken in any grade. The two credits in Foreign Language may be taken in any two of the four grades.
 **This list is not exhaustive; it contains examples of Health Science careers.

