



OREGON
DEPARTMENT OF
EDUCATION



OREGON CAREER AND TECHNICAL EDUCATION STATEWIDE FRAMEWORKS

Health Sciences Career Cluster

Resource Guide



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Statewide Framework for **Health Sciences**

Well-designed career and technical education (CTE) programs help high school and college students make successful educational transitions and find employment in high-wage, high-skill, in-demand careers. **Oregon's State Plan for CTE: 2024–2027** lays out a comprehensive strategy for ensuring all Oregonians have equitable access to high-quality CTE programming. This entails designing instructional coursework that is sequenced within and across the secondary and postsecondary educational levels, grounded in rigorous academic knowledge and technical skills, and aligned with industry needs. It also requires creating quality relationships, experiences, and interactions among learners, educators, business partners, and community members.

OREGON'S VISION FOR CTE

Reimagine and transform learner experiences to enhance their future prospects, empower communities, and ensure equitable access to an inclusive, sustainable, innovation-based economy.

This document provides information and resources related to the ***Statewide Framework in the Health Sciences Career Cluster***, which falls within the Health Sciences learning area. Health Sciences is one of 17 Career Clusters used to organize and deliver CTE programming in Oregon. The cluster includes five program areas from the pre-existing skill statements cluster that were incorporated into three focus areas: (1) Biotechnology, (2) Therapeutic & Diagnostic Services, and (3) Health Informatics & Support Services.

Oregon's CTE state plan calls for the development of Statewide Frameworks to guide program design. The goal is to improve *instructional quality* by aligning technical skills to the needs of employers in high-wage, high-skill, in-demand careers; promote equity by ensuring that all learners have access to consistent, high-quality programming; *strengthen career pathways* by intentionally connecting secondary and postsecondary coursework that culminates in an industry-recognized credential or certificate, or associate or baccalaureate degree; and *expand student access to dual and concurrent enrollment credits* to reduce tuition costs and the time required to earn a postsecondary credential.

While secondary and postsecondary CTE providers have considerable flexibility in designing curriculum and assessments, state approval is required to qualify programs for federal and/or state funding. This includes aligning offerings with labor market needs; meeting state-defined criteria for size, scope, and quality; addressing Oregon's five core elements of a Program of Study; and continuously improving CTE offerings through the use of the **High Quality CTE Program of Study Rubric**.

In Oregon, a CTE Program of Study is the primary vehicle for delivering coursework at the secondary and postsecondary levels. A CTE Program of Study is a progressive, nonduplicative sequence of courses, developed by a partnering secondary school district and postsecondary institution, to prepare students to seamlessly transition across education levels and into the workforce. Coursework integrates rigorous

academic knowledge with industry-validated employability and technical skills and culminates in the award of an industry-recognized credential or certificate, or an associate or baccalaureate degree. High school students may also have options to earn credit that may be applied toward their postsecondary studies.

Within each Career Cluster, CTE Programs of Study may be offered at the Career Cluster or Focus Area levels. Career Cluster-level Programs of Study offer students broad exposure to multiple careers in the field, along with cross-cutting skills valued by all industry employers. Focus Area-level Programs of Study offer students more occupationally specific training with a higher level of statewide content standardization.

The new Statewide CTE Frameworks provide updated Knowledge and Skill Statements to inform CTE program development. The updated skill statements incorporate: 1) employability skills commonly found in all jobs in all Career Clusters; 2) cross-cutting technical skills applicable to all jobs in a specific Career Cluster; and 3) Focus Area skills applicable to a specific set of occupations. Each skill statement includes an optional set of Suggested Performance Indicators intended to help educators develop curriculum and assessments to teach specific skills.

Projected Labor Market Demand

Occupational projections published by the State of Oregon Employment Department indicate that while jobs in the Health Sciences field will expand over the coming decade, a subset will experience significant demand. These occupational titles, their projected demand, and associated wage and educational expectations of entry-level employees are detailed in Table 1.

Table 1. Occupational Employment Projections in Oregon, 2021–2031

Standard Occupational Classification (SOC)* code	Occupational title	Total job openings	Percent change	2022 median annual wage	Entry-level education
11-9111	Medical and Health Services Managers	5,583	35.1%	\$122,699	Bachelor's degree
19-5011	Occupational Health and Safety Specialists	857	10.6%	\$82,285	Bachelor's degree
21-1022	Healthcare Social Workers	1,986	12.7%	\$80,766	Bachelor's degree
21-1023	Mental Health and Substance Abuse Social Workers	1,965	18.6%	\$50,981	Master's degree
21-1029	Social Workers, All Other	1,959	8.3%	\$56,181	Bachelor's degree
21-1091	Health Education Specialists	847	12.7%	\$65,728	Bachelor's degree

Standard Occupational Classification (SOC)* code	Occupational title	Total job openings	Percent change	2022 median annual wage	Entry-level education
25-1071	Health Specialties Teachers, Postsecondary	3,569	26.8%	\$132,001	Master's degree
29-1051	Pharmacists	2,232	9.6%	\$136,323	Doctoral or professional degree
29-1071	Physician Assistants	1,577	35.6%	\$132,288	Master's degree
29-1122	Occupational Therapists	1,143	17.9%	\$99,590	Master's degree
29-1123	Physical Therapists	2,042	20.8%	\$98,446	Doctoral or professional degree
29-1126	Respiratory Therapists	1,141	23.5%	\$79,685	Associate's degree
29-1127	Speech-Language Pathologists	1,548	24.9%	\$95,534	Master's degree
29-1131	Veterinarians	1,272	27.9%	\$104,021	Doctoral or professional degree
29-1141	Registered Nurses	25,047	10.3%	\$103,002	Bachelor's degree
29-1171	Nurse Practitioners	2,973	57.7%	\$132,288	Master's degree
29-1228	Physicians, All Other; and Ophthalmologists, Except Pediatric	2,167	7.8%	NA	Doctoral or professional degree
29-1292	Dental Hygienists	2,539	8.5%	\$101,795	Associate's degree
29-2010	Clinical Laboratory Technologists and Technicians	2,215	8.0%	\$77,189	Bachelor's degree
29-2034	Radiologic Technologists and Technicians	1,388	9.2%	\$80,808	Associate's degree
29-2055	Surgical Technologists	1,320	9.6%	\$62,962	Postsecondary training
29-2061	Licensed Practical and Licensed Vocational Nurses	3,218	12.0%	\$62,400	Postsecondary training
29-2098	Medical Dosimetrists, Medical Records Specialists, and Health Technologists and Technicians, All Other	3,547	10.5%	NA	Postsecondary training
29-9098	Health Technologists, Medical Registrars, Surgical Assistants, Healthcare Practitioners & Technical Workers, All Other	849	10.0%	NA	Associate's degree
31-1133	Psychiatric Aides	1,278	9.5%	\$50,440	High school diploma or equivalent

Standard Occupational Classification (SOC)* code	Occupational title	Total job openings	Percent change	2022 median annual wage	Entry-level education
31-2021	Physical Therapist Assistants	1,481	39.7%	\$65,520	Associate's degree
31-9011	Massage Therapists	3,957	34.3%	\$74,942	Postsecondary training
31-9091	Dental Assistants	5,543	8.9%	\$51,022	Postsecondary training
31-9093	Medical Equipment Preparers	1,601	9.0%	\$48,880	Postsecondary training
43-1011	First-Line Supervisors of Office and Administrative Support Workers	13,942	1.5%	\$63,378	High school diploma or equivalent

Note: Adapted from [**State of Oregon Employment Department: High-Wage, High-Demand, and High-Skill Occupations \(Projections 2021-2031\)**](#)

*SOC code = Standard Occupational Classification used to classify workers into job categories.

Among occupations that are considered high-wage and high-demand,¹ the largest rate of occupational growth in Oregon is projected for Nurse Practitioners, with opportunities expected to increase by nearly 58 percent between 2021 and 2031. This will lead to 2,973 projected job openings, including new and replacement workers. Relatively large job openings are anticipated in other high-wage and high-demand occupations that are associated with programs of study commonly found in Oregon high schools and community colleges. These include physical therapist assistants with 1,481 projected openings, physician assistants with 1,557 projected openings, and medical and health sciences managers with 5,583 projected openings.

Jobs in the Health Sciences field typically pay high wages. Median annual wages in 2022 for the two highest paying jobs requiring an associate degree were dental hygienists (\$101,795) and radiologic technologists and technicians (\$80,808). Wages in jobs associated with a high school diploma or its equivalent also paid relatively well. For example, the median annual wage for first-line supervisors of office and administrative support workers was \$63,378.

While most health sciences jobs offer high wages, individuals must earn an advanced postsecondary degree to succeed in the labor market. For this reason, participation in a CTE Program of Study in the Health Sciences Career Cluster may offer students important insights into the types of careers that exist and the education and training necessary to advance in their career.

¹ High-wage occupations are those paying more than the all-industry median wage for a particular area. High-demand occupations are those having more than the statewide median number of total openings (growth plus replacement) for a particular area.

Statewide Program of Study Framework

Programs of study in the Health Sciences Career Cluster prepare students for entry-level employment in a range of careers central to Oregon's economic base and/or to pursue advanced postsecondary educational studies. When proposing programming, secondary and postsecondary CTE providers collaborate to offer coursework leading to an industry-recognized certificate and/or an associate or baccalaureate degree. High school students also may be offered the opportunity to earn college credit that may be applied towards their certificate or degree objective.

In spring 2024, the Oregon Department of Education launched a statewide effort to update and revalidate the skills and indicators used to define the Health Sciences Career Cluster. An advisory group composed of 17 Oregon employers and professional association representatives was seated to identify the skills desired of entry-level workers. Members reviewed and provided feedback on existing state skills and those used in other states. Based on their work, an updated set of skills and indicators was developed. A statewide survey was then conducted to solicit feedback from employers throughout Oregon. A total of 26 employers responded. Skills sets and indicators were updated to incorporate the feedback that was received.

To gather input from educators, a second advisory group was formed. This included 16 representatives of Oregon school districts and community colleges offering instruction in related CTE Programs of Study. Members offered feedback on the skill sets and indicators identified by employers, as well as how they related to their current instruction. Following updates to the list, a statewide survey of district CTE Program of Study leaders and community college faculty was conducted. Individuals were asked to rate the importance of the employer-vetted Knowledge and Skill Statements and Suggested Performance Indicators. A total of 12 high school instructors and 14 community college faculty members responded.

Community college faculty were asked to provide feedback on each Knowledge and Skill Statement and rate the importance of Suggested Performance Indicators using the following scale:

- **Critically important.** This skill would be expected of students continuing their studies at a community college offering related programming or entering the workforce after having completed a CTE Program of Study at the high school level
- **Somewhat important.** This skill would be useful but not necessary for students continuing their studies at a community college offering related programming or entering the workforce after having completed a CTE Program of Study at the high school level
- **Not important.** This skill would *not* be expected of students continuing their studies at a community college offering related programming or entering the workforce after having completed a CTE Program of Study at the high school level (i.e., it will be taught in college or on the job)

High school CTE instructors were asked to rate the importance of high school graduates in related CTE Programs of Study mastering these skills upon completing their secondary CTE studies.

Feedback from survey respondents was analyzed to produce a core set of Knowledge and Skill Statements and Suggested Performance Indicators that secondary educators should consider when designing CTE programs and formulating their CTE program approval applications.

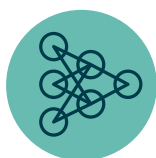
Knowledge and Skill Statements

Knowledge and Skill Statements describe the learning expectations of students in CTE programs. Ideally, skills marked as Foundational will be taught during a student's high school CTE Program of Study experience, with educators determining how and when instruction occurs. The CTE Statewide Framework for Health Sciences is organized around three levels of skills.



Employability Knowledge and Skills – *Applicable to all Career Clusters*

All learners are expected to master these basic skills to function in the workplace. These cross-cutting abilities, found in all jobs in all industries, encompass a broad range of communication, critical thinking, interpersonal, and organizational skills imperative for career success.



Career Cluster-Level Knowledge and Skills – *Applicable to all careers in the Health Sciences Cluster*

All workers in the health sciences industry are expected to have a broad understanding of the field. These cross-cutting skills prepare workers to succeed in a range of jobs in the cluster. High school students mastering these skills are prepared to enter college or the workforce with an understanding of their career options and training needs.



Focus Area-level Knowledge and Skills – *Applicable to a specific career*

Field-specific knowledge that an entering college student or entry-level worker would be expected to possess. High school students mastering these skills are prepared to enroll in college to pursue advanced training or enter employment prepared to succeed. Postsecondary graduates would be prepared to enter employment with a credential, certificate, or degree.

These skills have been classified based on the level of knowledge required for their mastery:²

- **Foundational Skills** describe technical skills that all high school students completing a Program of Study would be expected to master. Ideally, these skills would be

² Survey respondents did not rate any skills as being sufficiently advanced to be taught primarily at the postsecondary level. Accordingly, skills have been classified into the two categories foundational and intermediate, which differs from classifications used in other learning areas.

taught within a high school CTE Program of Study (or in collaboration with a post-secondary partner if it is not feasible within high school).

■ **Intermediate Skills** describe more technically advanced skills that high school instructors are encouraged to teach in a CTE Program of Study, though some might be taught at a partnering community college due to equipment or time constraints.

Overarching descriptions of the Knowledge and Skill statements for new Statewide Frameworks in (1) Biotechnology, (2) Therapeutic & Diagnostic Services, and (3) Health Informatics & Support Services are listed in Figure 1.

Each Knowledge and Skill Statement includes a list of Suggested Performance Indicators that illustrate how students might demonstrate their understanding or abilities relating to each statement (see Appendix A). These examples are intended to provide educators with guidance in establishing program standards and assessments and designing curriculum and instructional activities. These skills also have been classified based on their level of difficulty, ranging from foundational to intermediate to advanced.³

Suggested Performance Indicators are offered as an optional, industry-suggested, community college faculty-vetted way to demonstrate the Knowledge and Skill Statements. They are not required. Educators may choose to select from these indicators and/or design other means for students to show skill mastery in their CTE Program of Study. It is anticipated that secondary and postsecondary educators will collaborate in selecting the number, type, and technical specificity of Suggested Performance Indicators, as well as the educational level at which they will be taught.

³ Based on the statewide educator survey results, no health sciences skills were classified as advanced.

Figure 1. Knowledge and Skill Statements for the Statewide Framework for Health Sciences Cluster

EMPLOYABILITY	CAREER CLUSTER		
<i>Cross-cutting, same for all Career Clusters</i>	<ul style="list-style-type: none">• Explain the history, trends, and career paths within healthcare• Identify and explain key healthcare systems• Evaluate the roles and responsibilities of healthcare teams• Describe common health industry technologies and how to use them• Analyze legal responsibilities, limitations, and implications of actions• Analyze established practices, procedures, and standards• Understand the patient rights, including confidentiality• Describe ethics as they apply to healthcare delivery	<ul style="list-style-type: none">• Identify safety hazards to patients, co-workers, self, and the environment• Use appropriate techniques for ensuring patient safety• Demonstrate personal safety practices• Promote health and wellness• Use terminology and protocols for communicating effectively• Use knowledge of human anatomy and physiology in a healthcare role• Use knowledge of diseases and disorders in a healthcare role• Understand different ethnic, racial, cultural, and special populations factors	
BIOTECHNOLOGY FOCUS AREA	THERAPEUTIC & DIAGNOSTIC SERVICES FOCUS AREA	HEALTH INFORMATICS AND SUPPORT SERVICES FOCUS AREA	
<ul style="list-style-type: none">• Summarize legal and ethical protocols of biotechnology R&D• Apply mathematical concepts• Use statistical data when conducting biotechnology R&D• Apply genetic principles• Use standard procedures in applying general and organic chemistry principles• Apply principles of biochemistry to biotechnology• Recognize basic concepts in cell biology and the use of laboratory tools• Understand fundamentals of molecular cell biology• Describe reproduction of microorganisms in clinical and lab applications• Identify techniques, trends, and current areas of research• Demonstrate solution preparation, sterile technique, and contamination control• Understand product development processes and regulations• Understand ethical, moral, legal, and cultural issues in biotechnology R&D	<ul style="list-style-type: none">• Recognize the integrated systems approach to healthcare delivery• Practice components of patient intake assessment• Assess and document patients using accurate medical terminology• Use effective oral and written communications with patients• Understand facility protocols, regulations, and practices• Evaluate patient needs, strengths, and problems• Use oral communication to share diagnostic information• Use written communication to share patient health conditions• Understand the purpose of common diagnostic procedures• Explain behavioral health assessments and treatments	<ul style="list-style-type: none">• Understand healthcare system organizations and their components• Understand how to use health information effectively• Use an electronic healthcare patient information system• Share and maintain health information within legal/regulatory guidelines• Share health information accurately within legal/regulatory guidelines• Abstract and code medical records and documents• Demonstrate decontamination techniques and procedures• Employ best practices for handling hazardous materials and waste• Employ best safety practices for handling and storing common materials• Use financial data to make purchasing and maintenance decisions• Apply correct protocols in acquiring equipment and materials	

Program of Study Design Options

Educators have two options in designing a Program of Study using a Statewide Framework. They can pursue a Career Cluster-level Program of Study or a Focus Area-level Program of Study. The distinction between a Cluster and Focus Area Program of Study relates to the scope of Knowledge and Skill Statements covered in the Program of Study and level of secondary to postsecondary alignment.

There are two primary distinctions between the options:

1. Educators choosing to offer a **Career Cluster Program of Study** are encouraged to cover all the employability skills and Cluster-level skills identified and draw on the foundational skills and Suggested Performance Indicators included in one or more Focus Areas.
2. **Focus Area Programs of Study** are more occupationally specific with a higher level of content standardization. Educators are encouraged to cover all the employability skills, Cluster-level skills, and foundational skills identified within a Focus Area, consulting the Suggested Performance Indicators to design programming. Intermediate and advanced skills also may be addressed, either at the high school level or in collaboration with a postsecondary partner.

Career Cluster-Level Program of Study Option

A Career Cluster-level Program of Study provides high school students with a broad overview of the Health Sciences field to prepare them to specialize in an area of their choosing at the postsecondary level. With this option, educators may choose to offer a broad range of courses that address different aspects of the field, drawing on skills included in each of the identified Focus Areas.

To qualify as a concentrator at the Career Cluster-level, high school students must earn at least two credits in a state-approved Program of Study sequence, with one of these credits awarded as part of the second or third course in a sequence. High school graduates concentrating their studies in the Health Sciences Career Cluster would have the option of continuing their studies at an affiliated community college or a four-year college or university, where they could pursue related training that culminates in the award of a credential, certificate, or associate degree.

Focus Area-Level Program of Study Option

Focus Area-level Programs of Study are intended to align with specific certificate and associate degree options offered at the postsecondary level. Where appropriate, districts and colleges can negotiate dual credit agreements so that high school students can earn college credit that may be applied toward a postsecondary certificate or degree, expediting the time it takes to complete.

The new statewide Program of Study option requires:

- Offering a minimum of three credits at the secondary level and 36 credits at the postsecondary level
- Covering all the employability, Career Cluster, and foundational Focus Area skills as part of the high school component of a CTE Program of Study or in collaboration with a postsecondary partner
- Requiring concentrators to earn two credits in the Program of Study, including at least one credit awarded as part of the second or third course in a sequence
- Providing a sequenced, progressive set of courses, including an introductory or survey course, and two courses offering more technically advanced skills
- Exhibiting secondary-postsecondary standards alignment that is clearly defined and communicated to all relevant parties
- Offering or potentially offering dual credit opportunities
- Integrating career-related learning experiences, career-connected learning, and work-based learning in meaningful ways

High school graduates concentrating their studies in the Health Sciences field would have the option of continuing their studies at an affiliated community college or four-year college or university, where they could seek advanced training in the Focus Area or pursue training in a related field that culminates in the award of a credential, certificate, or associate degree.

Statewide Framework Programs of Study align course standards to industry-validated skills so that students throughout the state have access to consistent, high-quality CTE with opportunities to gain college credit and skills in in-demand occupations.

Course Scope and Sequence

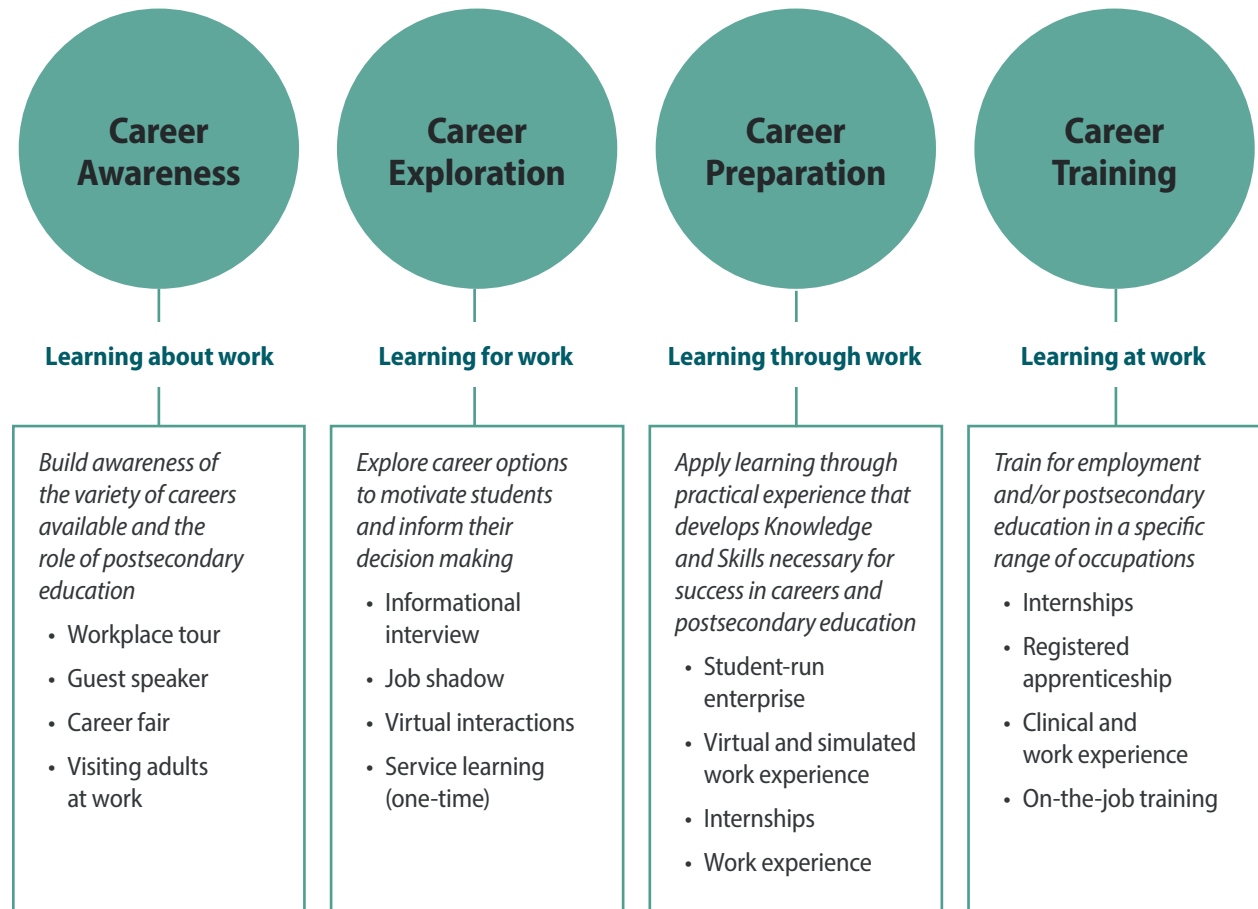
It is anticipated that CTE students will begin their course sequence with an introductory/survey course that opens a range of more technically advanced course options. An example of how a Program of Study might be configured for each Focus Area is provided in Table 2. *Note that course sequences and titles are provided for illustrative purposes only—it is up to secondary and postsecondary partners to determine course titles and sequences; course content, curriculum, and assessments, including when and how Knowledge and Skill Statements are addressed; and whether dual credit or industry certifications may be awarded.*

Table 2. Sample Scope and Sequence for Cluster-level and Focus Area-level Program of Study

Course level	Grade	Course
Course 1	Grades 9 or 10	Cluster Level. Introduction to Health Occupations
Course 2	Grades 10 or 11	Cluster Level. Human Anatomy and Physiology Focus Area Level. Introduction to BioScience Technologies Focus Area Level. Introduction to Basic Caregiving Focus Area Level. Medical Office Procedures
Course 3	Grades 11 or 12	Cluster Level. Medical terminology Focus Area Level. Biomanufacturing Focus Area Level. Medical Law and Ethics Focus Area Level. Medical Law and Ethics
Capstone	Grade 12	Cluster Level. Medical interventions or internship Focus Area Level. Advanced BioScience or work-based learning experience Focus Area Level. Sports Medicine or work-based learning experience Focus Area Level. Advanced Principles of Health Care or work-based learning experience

Additionally, all Programs of Study are expected to integrate a full range of **Career Connected Learning Experiences** that advance progressively, as indicated in Figure 2.

Figure 2. Career Connected Learning Experiences



Developing a CTE Program of Study for State Approval

To meet Oregon's definition of a High-Quality Program of Study, a CTE Program of Study must be built around five core elements. These elements and supporting components, which align to the Association for Career and Technical Education's (ACTE's) High-Quality CTE Program of Study Framework, are detailed in Table 3.

Table 3. Elements and Supporting Components of a High-Quality CTE Program of Study

Element	Components
Standards and Content	Rigorous Integrated Content: Appropriately licensed secondary teachers and postsecondary instructors integrate rigorous technical and academic content.
	Engaged Learning: Students are engaged through instructional strategies that are relevant and authentic, and meet the needs and interests of all students.
	Coherent Curriculum: Aligned to industry-identified standards and sequenced to prepare students for their next steps.
Alignment and Articulation	Partnerships: Actively engages employer and educator partners to develop, enhance, and support the CTE program in a manner that is sustainable.
	Credentials: Links instruction to meaningful college credit or industry credentials that can lead to high-wage, high-skill, and in-demand occupations.
	Facilities and Equipment: Provides students with safe access to facilities and equipment appropriate to the type of instruction and reflective of workforce needs.
Accountability and Evaluation	Continuous Improvement: Revisions to the Program of Study are based on student performance, economic demand, and employer requirements.
Student Support Services	Equity and Access: Provides all students and their families with appropriate knowledge and experiences to help make informed education and career decisions.
	Career Connected Learning: Provides quality, accurate and timely information and support that will help students identify, pursue, transition to, and complete pathways to future careers. Career Connected Learning should include activities and opportunities within the four domains of Awareness, Exploration, Preparation and Training.
Professional Development	Professional Development: Promotes instructional long-term growth that aligns with long-term program goals.

Educators are encouraged to consult the [High Quality CTE Program of Study Rubric](#) and accompanying [Quick Guide to Using the High Quality CTE Program of Study Rubric](#) to assess their existing CTE Programs of Study and create goals for continuous improvement.

CTE Licensure Requirements.

Health Sciences

Educators seeking to teach in the Health Sciences Career Cluster must possess a valid Oregon CTE endorsement. See [CTE Licensure in Oregon](#) for an overview of licensing requirements and the steps to be taken to receive an endorsement. Contact **Muhammad Rahman** (Muhammad.Rahman@ode.oregon.gov).

Student Leadership

Learning is enhanced when students can apply academic, technical, and employability skills in an authentic setting. Career and Technical Student Organizations (CTSOs) are extracurricular groups that offer youth the ability to practice and enhance their classroom learning while developing personal skills and leadership abilities through participation in activities, events, and competitions.

In the Health Sciences field, the following CTSO is active in Oregon:



Oregon HOSA (<https://oregonhosa.org/>) prepares student leaders for careers in the medical, dental, and healthcare industry, both in high school and college.

Appendix A. Health Sciences Career Cluster Knowledge and Skill Statements and Suggested Performance Indicators

Overview

This document details the Knowledge and Skill Statements comprising the Programs of Study for the: (1) Biotechnology, (2) Therapeutic & Diagnostic Services, and (3) Health Informatics & Support Services Focus Areas. These statements, developed with input by employers, define the career readiness expectations of entry-level workers.

Community college faculty were asked to provide feedback on each Knowledge and Skill Statement and rate the importance of each Suggested Performance Indicator using the following scale:

- **Critically important.** This skill would be expected of students continuing their studies at a community college offering related programming or entering the workforce after having completed a CTE Program of Study at the high school level
- **Somewhat important.** This skill would be useful but not necessary for students continuing their studies at a community college offering related programming or entering the workforce after having completed a CTE Program of Study at the high school level
- **Not important.** This skill would *not* be expected of students continuing their studies at a community college offering related programming or entering the workforce after having completed a CTE Program of Study at the high school level (i.e., it will be taught in college or on the job)

To gather district perspectives, high school CTE instructors with approved programs were asked to rate the importance of high school graduates in related CTE programs of study mastering these skills upon completing their secondary CTE studies.

Feedback from survey respondents was analyzed to produce a core set of Knowledge and Skill Statements and Suggested Performance Indicators that secondary educators should consider when designing CTE programs and formulating their CTE program approval applications.

These Knowledge and Skill Statements and Suggested Performance Indicators are intended to provide educators with guidance in establishing program standards and assessments and designing curriculum and instructional activities. *Performance indicators are offered as suggestions, not requirements, for addressing the Knowledge and Skill Statements comprising a Program of Study.*

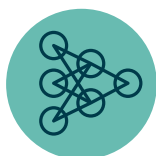
How to Use This Document

Educators offering a CTE Program of Study in the Health Sciences Career Cluster should review the Knowledge and Skill statements and Suggested Performance Indicators in this document. Ideally, skills marked as Foundational will be taught during a student's high school CTE Program of Study experience, with educators determining how and when instruction occurs. Three types of skills and indicators are provided:



Employability Knowledge and Skills – *Applicable to all Career Clusters*

All learners are expected to master these basic skills to function in the workplace. These cross-cutting abilities, found in all jobs in all industries, encompass a broad range of communication, critical thinking, interpersonal, and organizational skills imperative for career success.



Career Cluster-Level Knowledge and Skills – *Applicable to all careers in the Health Sciences Cluster*

All workers in the Health Sciences industry are expected to have a broad understanding of the field. These cross-cutting skills prepare workers to succeed in a range of jobs in the cluster. High school students mastering these skills are prepared to enter college or the workforce with an understanding of their career options and training needs.



Focus Area-level Knowledge and Skills – *Applicable to a specific career*

Field-specific knowledge that an entering college student or entry-level worker would be expected to possess. High school students mastering these skills are prepared to enroll in college to pursue advanced training or enter employment prepared to succeed. Postsecondary graduates would be prepared to enter employment with a credential, certificate, or degree.

These skills have been classified based on the level of knowledge required for their mastery:⁴

- **Foundational Skills** describe technical skills that all high school students completing a Program of Study would be expected to master. Ideally, these skills would be taught within a high school CTE Program of Study (or in collaboration with a postsecondary partner if it is not feasible within high school).

- **Intermediate Skills** describe more technically advanced skills that high school instructors are encouraged to teach in a CTE Program of Study, though some might be taught at a partnering community college due to equipment or time constraints.

⁴ Survey respondents did not rate any skills as being sufficiently advanced to be taught primarily at the postsecondary level. Accordingly, skills have been classified into the two categories foundational and intermediate, which differs from classifications used in other learning areas.

Health Sciences Career Cluster

Knowledge and Skill Statements

Employability Knowledge and Skills

These Knowledge and Skill statements apply to all Career Clusters in Oregon.

Code number	Knowledge and Skill Statement
E-01	Adhere to workplace practices
E-02	Exhibit personal responsibility and accountability
E-03	Practice cultural competence
E-04	Demonstrate teamwork and conflict resolution
E-05	Communicate clearly and effectively
E-06	Employ critical thinking to solve problems
E-07	Demonstrate creativity and innovative thinking
E-08	Demonstrate fluency in workplace technologies
E-09	Plan, organize, and manage work
E-10	Make informed career decisions

Career Cluster-Level Knowledge and Skills

These Knowledge and Skill statements apply to all Health Sciences Programs of Study in Oregon.

Code number	Knowledge and Skill Statement
CC-HS01	Explain the history, trends, and career pathways within the healthcare system
CC-HS02	Identify and explain key components of the healthcare delivery system
CC-HS03	Evaluate the roles and responsibilities of individual members of the healthcare team and explain their role in promoting the delivery of quality healthcare
CC-HS04	Describe common health industry technologies and tools and how to use them securely and effectively
CC-HS05	Analyze the legal responsibilities, limitations, and implications of actions within the healthcare workplace
CC-HS06	Analyze the established practices, procedures, and standards associated with the healthcare workforce
CC-HS07	Understand and maintain patient rights, including confidentiality
CC-HS08	Describe ethics as they apply to healthcare delivery

Code number	Knowledge and Skill Statement
CC-HS09	Identify existing and potential safety hazards to patients, co-workers, self, and environment within the healthcare setting
CC-HS10	Use appropriate techniques for ensuring patient safety when positioning, transferring, and transporting patients
CC-HS11	Demonstrate personal safety practices
CC-HS12	Promote health and wellness
CC-HS13	Accurately use health sector terminology and protocols for communicating effectively
CC-HS14	Use knowledge of human anatomy and physiology in a healthcare role
CC-HS15	Use knowledge of diseases and disorders in a healthcare role
CC-HS16	Understand factors that define cultural differences between and among different ethnic, racial, and cultural groups and special populations

Focus Area Level Knowledge and Skills

These are updated Knowledge and Skill Statements for the three Focus Area Programs of Study in the Health Sciences Career Cluster.

BIOTECHNOLOGY

Code number	Knowledge and Skill Statement
FA-BIOT01	Summarize the goals of biotechnology research and development within legal and ethical protocols
FA-BIOT02	Apply mathematical concepts to the field of biotechnology
FA-BIOT03	Use statistical data when conducting biotechnology research and development
FA-BIOT04	Apply genetic principles to biotechnology
FA-BIOT05	Use standard operating procedure (SOP) when performing systematic and methodical application of general and organic chemistry principles
FA-BIOT06	Apply principles of biochemistry to biotechnology
FA-BIOT07	Recognize basic concepts in cell biology and become familiar with the laboratory tools used for their analysis
FA-BIOT08	Understand the fundamental principles of molecular cell biology
FA-BIOT09	Describe the morphology and process of reproduction of microorganisms important in clinical disease and biotechnology applications
FA-BIOT10	Identify techniques, trends, and current areas of research in biotechnology

Code number	Knowledge and Skill Statement
FA-BIOT11	Demonstrate the principles of solution preparation, sterile techniques, contamination control, and measurement and calibration of instruments used in biotechnology research
FA-BIOT12	Understand the biotechnology product development processes and regulations that affect those processes
FA-BIOT13	Understand the ethical, moral, legal, and cultural issues related to the use of biotechnology research and product development

THERAPEUTIC & DIAGNOSTIC SERVICES

Code number	Knowledge and Skill Statement
FA-TD01	Recognize the integrated systems approach to healthcare delivery services
FA-TD02	Recognize and practice components of an intake assessment relevant to patient care
FA-TD03	Assess the state of the patient and document using accurate medical terminology
FA-TD04	Use effective oral and written communication techniques when responding to patient questions and concerns
FA-TD05	Understand that treatment/care plans must adhere to facility protocols, regulatory guidelines, and scope of practice
FA-TD06	Evaluate patient needs, strengths, and problems to determine if treatment/care goals are being met
FA-TD07	Use effective oral communication when communicating diagnostic information with departments and professionals
FA-TD08	Use effective written communication techniques when communicating patient health condition information with departments and professionals
FA-TD09	Understand the purpose of common diagnostic procedures
FA-T10	Explain behavioral health assessments and treatments

HEALTH INFORMATICS AND SUPPORT SERVICES

Code number	Knowledge and Skill Statement
FA-HISS01	Understand healthcare systems as the organization of people, institutions, funding, and resources
FA-HISS02	Understand how to use health information effectively
FA-HISS03	Use an electronic healthcare patient information system to optimize the acquisition, storage, retrieval, and use of information
FA-HISS04	Document, communicate, and maintain health information within legal and regulatory guidelines

Code number	Knowledge and Skill Statement
FA-HISS05	Communicate health information accurately and within legal and regulatory guidelines, upholding the strictest standards of confidentiality
FA-HISS06	Understand how to abstract and code information from medical records and documents using industry standard methods of classification
FA-HISS07	Demonstrate various decontamination techniques and procedures
FA-HISS08	Employ best safety practices for handling hazardous materials and managing waste
FA-HISS09	Employ best safety practices for handling and storing a variety of materials common to the health services environment
FA-HISS10	Utilize financial information and data to make appropriate decisions regarding purchase and maintenance of equipment and materials
FA-HISS11	Apply principles and organizational protocols when acquiring and distributing equipment and materials

Employability Knowledge and Skill Statements with Suggested Performance Indicators

● **Foundational** - Basic skills that **should be taught** within high school or, if not feasible, at a partnering college

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational
E-01 <i>Adhere to workplace practices</i>	A. Explain and follow workplace standards, rules, and regulations B. Show up on time and prepared to work C. Demonstrate the ability to take direction, be proactive, and work independently	●
E-02 <i>Exhibit personal responsibility and accountability</i>	A. Apply professional and ethical standards of the industry to personal conduct B. Maintain integrity and promote personal and professional integrity in co-workers C. Take responsibility and carry out work assignments	●
E-03 <i>Practice cultural competence</i>	A. Demonstrate awareness of issues related to diversity, equity, and inclusion B. Work effectively with colleagues of differing abilities, cultures, and backgrounds C. Describe issues relating to workplace harassment D. Model behaviors that are respectful and sensitive of others	●
E-04 <i>Demonstrate teamwork and conflict resolution</i>	A. Demonstrate the ability to collaborate and contribute to the work of a diverse team B. Explain when it is appropriate to lead and when to follow another's lead C. Demonstrate strategies for resolving issues with coworkers	●
E-05 <i>Communicate clearly and effectively</i>	A. Listen attentively, and speak and write clearly to convey information correctly B. Interpret information and instructions presented in verbal and written form C. Demonstrate effective communication with colleagues, supervisors, customers, and suppliers D. Demonstrate the ability to communicate verbally, in writing, and using electronic communication tools	●

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational
E-06 <i>Employ critical thinking to solve problems</i>	<ul style="list-style-type: none"> A. Recognize problems in the workplace and diagnose their root causes B. Develop well-reasoned plans to solve identified challenges C. Apply and follow through on plans to ensure that problems are resolved 	●
E-07 <i>Demonstrate creativity and innovative thinking</i>	<ul style="list-style-type: none"> A. Develop ideas to solve problems in new and different ways B. Investigate one's own and others' ideas to find those with greatest applicability C. Develop and deploy plans to implement new ideas in the workplace 	●
E-08 <i>Demonstrate fluency in workplace technologies</i>	<ul style="list-style-type: none"> A. Demonstrate knowledge and application of general technology skills, including hardware and software commonly used in the industry B. Use online communication, networking tools and social networks to access, manage, evaluate, and create information to successfully function in a knowledge economy C. Describe and demonstrate a fundamental understanding of the ethical, legal, and security issues surrounding access to and use of information technologies 	●
E-09 <i>Plan, organize, and manage work</i>	<ul style="list-style-type: none"> A. Identify an intended project outcome including available inputs, materials, labor, timeline for producing work, and job-site obligations B. Effectively plan, monitor, and complete projects on time and within budget using available resources and materials C. Demonstrate ability to write coherent reports and project summaries to communicate the progress of project work and its adherence to schedule 	●
E-10 <i>Make informed career decisions</i>	<ul style="list-style-type: none"> A. Identify job and entrepreneurial opportunities in the industry and the required education and credentials to obtain employment B. Set short- and long-term career goals based on personal interests and aptitudes C. Maintain a project portfolio D. Develop a professional resume E. Explain and demonstrate how to cultivate and maintain a professional presence in an online environment, including the appropriate use of social media and networking platforms 	●

Health Sciences Knowledge and Skill Statements with Suggested Performance Indicators

- **Foundational** - Basic skills that **should be taught** within high school or, if not feasible, at a partnering college
- **Intermediate** - Advanced skills **encouraged to be taught** within high school, with some offered at a partnering college

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
CC-HS01 <i>Explain the history, trends, and career pathways within the healthcare system</i>	A. Identify historical and current trends in healthcare and how they impact the system and society B. Explain current and potential uses of biotechnology within healthcare (e.g., vaccine development, genetically tailored health care) C. Compare and contrast various healthcare career pathways D. Describe different types of healthcare careers E. Identify the certification, licensing, and regulatory requirements associated with different healthcare pathways F. Describe the importance of major healthcare contributors and developments, linking them with modern innovations and practices	A. ● B. ● C. ● D. ● E. ●	F. ■
CC-HS02 <i>Identify and explain key components of the healthcare delivery system</i>	A. Describe the organizations that constitute healthcare delivery systems (e.g., insurance, individual providers, hospitals, rehabilitation centers) B. Predict where and how factors such as cost, managed care, technology, socioeconomics, an aging population, access to care, alternative therapies, and lifestyle/behavior changes may affect various healthcare delivery system models C. Describe different types of healthcare plans and the tradeoffs associated with each D. Differentiate among the methods of payment for healthcare in the United States including private and state or federal insurance E. Identify the different types of facilities and options for healthcare delivery in the United States healthcare delivery system F. Construct a general systems model using inputs, throughputs, and a feedback loop	A. ●	B. ■ C. ■ D. ■ E. ■ F. ■

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
CC-HS03 <i>Evaluate the roles and responsibilities of individual members of the healthcare team and explain their role in promoting the delivery of quality healthcare</i>	A. Describe the roles and responsibilities of individuals in different roles and in different parts of the healthcare industry and how they work together to address patient needs B. Collaborate effectively with individuals of diverse backgrounds C. Explain the types of expertise held by team members D. Recognize the importance of working collaboratively with persons from diverse backgrounds to accomplish a common goal E. Identify characteristics of effective teams	A. ● B. ● C. ● D. ● E. ●	
CC-HS04 <i>Describe common health industry technologies and tools and how to use them securely and effectively</i>	A. Evaluate the current and potential uses and risks of artificial intelligence within healthcare B. Understand security and confidentiality requirements for storage and transmission of electronic health records C. Understand common healthcare technologies, written communications, and security measures for documentation, retrieval, storage, and communication of health records D. Demonstrate how to use electronic charting, scheduling, and billing systems E. Identify social media technologies, apps, electronic conferencing, webpages, and email systems used to communicate information to team members and colleagues F. Describe how healthcare interoperability standards guide the exchange of health information between different systems, applications, and relevant parties	A. ● B. ● C. ● D. ●	E. ■ F. ■
CC-HS05 <i>Analyze the legal responsibilities, limitations, and implications of actions within the healthcare workplace</i>	A. Adhere to copyright and intellectual property laws and regulations, and appropriately cite proprietary information B. Identify policies and requirements for documentation and record keeping C. Compare and contrast behaviors and practices that could result in malpractice, liability, or negligence D. Evaluate what types of incidents need to be reported E. Identify relevant non-discrimination laws	A. ● B. ● C. ● D. ● E. ●	

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
CC-HS06 <i>Analyze the established practices, procedures, and standards associated with the healthcare workforce</i>	A. Summarize the Health Insurance Portability and Accountability Act (HIPAA), particularly those aspects related to patient rights, patient safety, and other ethical/legal directives governing medical treatment B. Access and analyze quality assurance standards of practice C. Identify local, district, state, and federal regulatory agencies, entities, laws, and regulations D. Employ practices that adhere to licensure, certification, registration, and legislated scope of practice E. Identify mandated standards for workplace safety, such as by the Occupational Safety and Health Administration (OSHA), the Centers for Disease Control and Prevention (CDC), and the Clinical Laboratory Improvement Amendments (CLIA) F. Summarize mandatory standards for harassment, labor, and employment laws	A. ● B. ● C. ● D. ● E. ● F. ●	
CC-HS07 <i>Understand and maintain patient rights, including confidentiality</i>	A. Describe confidentiality according to the Health Insurance Portability and Accountability Act (HIPAA) B. Apply the doctrine of informed consent C. Evaluate technological threats to confidentiality D. Understand the potential business and personal impacts of not upholding patient rights	A. ● B. ● C. ● D. ●	

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
CC-HS08 <i>Describe ethics as they apply to healthcare delivery</i>	A. Differentiate between morality and ethics and the relationship of each to healthcare outcomes B. Differentiate between ethical and legal issues impacting healthcare C. Analyze legal and ethical aspects of confidentiality D. Analyze and evaluate the implications of medical ethics E. Describe when to report activities and behaviors by oneself and others that adversely affect the health, safety, or welfare of patients or co-workers F. Demonstrate empathy and fair treatment of all persons G. Respect patients' autonomy in making decisions about their own healthcare H. Discuss the impact of religions and cultures on those giving and receiving healthcare with an understanding of past and present events I. Understand how the healthcare system does not always uphold ethics for individuals in marginalized communities and the impacts this has on health outcomes J. Demonstrate respect of individual cultural, social, and ethnic diversity within the healthcare environment	A. ● B. ● C. ● D. ● E. ● F. ● G. ● H. ● I. ● J. ●	
CC-HS09 <i>Identify existing and potential safety hazards to patients, co-workers, self, and environment within the healthcare setting</i>	A. Understand the fundamentals of standard and transmission-based precautions B. Use safe work practices and follow health and safety policies and procedures C. Practice appropriate cleaning, disinfecting, and sterilizing processes D. Use health and safety practices for storing and maintaining tools, equipment, and supplies E. Use safety data sheets (SDS) F. Understand the manufacturers' instructions for use (IFUs) of common medical instruments G. Contrast medical and surgical asepsis H. Demonstrate how to prevent and respond to work-related accidents or injuries I. Recognize hazardous chemicals commonly used in the healthcare environment and how to use them in an appropriate manner J. Utilize emergency procedures and protocols	A. ● B. ● C. ● D. ● E. ● F. ● G. ● H. ● I. ● J. ●	



Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
CC-HS10 <i>Use appropriate techniques for ensuring safety when positioning, transferring, and transporting patients</i>	A. Determine appropriate equipment for transportation and transfer B. Assess and adjust equipment and modify techniques to accommodate patient status C. Demonstrate appropriate transport and transfer methods to accommodate the health status of the patient D. Evaluate potential hazards to patient, oneself, and co-workers E. Integrate proper body mechanics, ergonomics, safety equipment, and techniques to prevent personal injury to patients, oneself, and other co-workers	A. ● B. ● C. ● D. ● E. ●	
CC-HS11 <i>Demonstrate personal safety practices</i>	A. Manage a personal exposure incident in compliance with Occupational Safety and Health Administration (OSHA) regulations B. Apply principles of body mechanics and ergonomics to protect oneself and others C. Use personal protective equipment (PPE) as appropriate to the environment D. Use techniques to ensure environmental safety and safe working conditions E. Demonstrate methods of fire prevention in the healthcare setting F. Prevent accidents by using proper safety techniques	A. ● B. ● C. ● D. ● E. ● F. ●	
CC-HS12 <i>Promote health and wellness</i>	A. Advocate for available preventive health screenings and examinations B. Use practices that promote the prevention of disease and injury C. Communicate to patients about high-risk behaviors D. Demonstrate personal health and wellness practices E. Evaluate complementary and alternative medicine approaches for optimizing health outcomes	A. ● B. ● C. ● D. ● E. ●	












Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
CC-HS13 <i>Accurately use health sector terminology and protocols for communicating effectively</i>	A. Communicate information and ideas effectively to multiple audiences using a variety of media and formats B. Demonstrate professional oral and written communication C. Evaluate how different cultures and generations attach different meanings to various gestures, intonations, and other communication techniques D. Identify barriers to accurate and appropriate communication E. Understand common de-escalation strategies F. Understand how to apply a trauma-informed approach to interactions with others G. Advocate and practice safe, legal, and responsible use of digital media information and communications technologies H. Recognize major word parts of medical terminology including roots, prefixes, and suffixes I. Understand how common terminology may differ for specific professions within healthcare	A. ● B. ● C. ● D. ● E. ● F. ● G. ● H. ● I. ●	
CC-HS14 <i>Use knowledge of human anatomy and physiology in a healthcare role</i>	A. Describe the organization of the human body B. Identify basic structures and describe functions of human body systems C. Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis D. Compare relationships among cells, tissues, organs, and systems E. Explain body planes, directional terms, quadrants, and cavities F. Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care/rehabilitation	A. ● B. ● C. ● D. ● E. ● F. ●	
CC-HS15 <i>Use knowledge of diseases and disorders in a healthcare role</i>	A. Compare selected diseases/disorders including respective classification(s), causes, diagnoses, therapies, and care/rehabilitation B. Analyze methods to control the spread of pathogenic microorganisms C. Explain the difference between situational and clinical behavioral disorders D. Contrast various types of immunities E. Analyze body system changes in light of diseases, disorders, and wellness F. Compare the aging process among the body systems	A. ● B. ● C. ● D. ● E. ● F. ●	

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
CC-HS16 <i>Understand factors that define cultural differences between and among different ethnic, racial, and cultural groups and special populations</i>	A. Understand the importance of culturally- and linguistically appropriate care and communication B. Utilize culturally appropriate community resources C. Examine the scientific basis for several complementary and alternative medicine approaches as practiced within various cultures D. Engage in self-reflection around one's own internal biases E. Ask questions and explore aspects of global significance F. Know when and how to incorporate trained interpreters to facilitate communication and improve patient outcomes	A. ● B. ● C. ● D. ● E. ● F. ●	

Biotechnology Knowledge and Skill Statements with Suggested Performance Indicators

Health sciences is a broad field with many entry points and career pathways. These knowledge and skill statements and suggested performance indicators may have different applications by industry sector.

-  **Foundational** - Basic skills that **should be taught** within high school or, if not feasible, at a partnering college
 **Intermediate** - Advanced skills **encouraged to be taught** within high school, with some offered at a partnering college

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-BIOT01 <i>Summarize the goals of biotechnology research and development within legal and ethical protocols</i>	A. Use data to explain biotechnology's contributions to quality of life B. Describe the use of model organisms in biotechnology research and manufacturing C. Recognize the role of innovation in the creation of emerging biotechnology careers D. Assess legal and ethical considerations associated with using biotechnology E. Propose a biological or industrial enzyme that could be used for treating disease and contribute to the quality of life F. Develop a list of environmental diseases or chronic conditions that have been or could be treated with biotechnology products	A.  B.  C.  D. 	E.  F. 
FA-BIOT02 <i>Apply mathematical concepts to the field of biotechnology</i>	A. Prepare solutions based on both percent and weight composition to demonstrate proficiency in use of mechanical and digital microbalances B. Calculate and prepare solutions of various molarity, calculate and prepare buffers of various pH, and prepare serial dilutions C. Explain scientific notation		A.  B.  C. 
FA-BIOT03 <i>Use statistical data when conducting biotechnology research and development</i>	A. Compare the standard deviation and the mean of data results from testing effectiveness of two biotechnology products B. Graphically illustrate a set of biotechnology data so that a layperson would understand it		A.  B. 



Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-BIOT04 <i>Apply genetic principles to biotechnology</i>	A. Describe the basic structure of a chromosome B. Construct a karyotype with human chromosomes C. Differentiate the genetic inheritance of a dominant homozygous trait (e.g., dwarfism) from a heterozygous disease (e.g., sickle cell anemia) D. Examine genetic factors beyond chromosomal arrangement, such as genomic data	A. ● B. ● C. ● D. ●	
FA-BIOT05 <i>Use standard operating procedure (SOP) when performing systematic and methodical application of general and organic chemistry principles</i>	A. Contrast covalent, ionic, and hydrogen bonding B. Use the periodic table to describe atomic structure and to characterize elements based on the functional group C. Construct a molecule of a compound with three or more carbon atoms D. Create an equation of two organic substrates leading to a product E. Describe atomic number, atomic mass, and orbitals F. Predict endothermic and exothermic characteristics of a chemical reaction	A. ●	B. ■ C. ■ D. ■ E. ■ F. ■
FA-BIOT06 <i>Apply principles of biochemistry to biotechnology</i>	A. Describe the relationship between biochemistry and biotechnology product development B. Compare the underlying reasons why some molecules are hydrophilic, and some are hydrophobic C. Diagram six chemical side groups that could be in a biotechnology product D. Categorize all amino acids into essential and non-essential	A. ● B. ●	C. ■ D. ■
FA-BIOT07 <i>Recognize basic concepts in cell biology and become familiar with the laboratory tools used for their analysis</i>	A. Describe the basic structures and functions of cells and how this knowledge is used in biotechnology B. Describe conditions that promote cell growth under aseptic conditions in the laboratory and workplace C. Use various methods to monitor the growth of cell cultures D. Explain the basic concepts of cell growth and reproduction, DNA replication, mitosis, meiosis, and protein synthesis E. Discuss the structure and function of the macromolecule	A. ● B. ● C. ● D. ● E. ●	












Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-BIOT08 <i>Understand the fundamental principles of molecular cell biology</i>	A. Describe the central dogma of molecular biology and how understanding this process impacts biotechnology research and development B. Define and describe the structure and function of DNA ribonucleic acid (RNA) and proteins, and explain the consequences of DNA mutations on proteins C. Use standard techniques of DNA extraction, purification, restriction digests, bacterial cell culture, and agarose gel electrophoresis and document and evaluate results D. Demonstrate and document and evaluate results of standard protein techniques, including antibody production, enzyme assays, spectrophotometry, gel electrophoresis, and chromatography E. Demonstrate DNA replication graphically and its importance to biotechnology product development	A. ● B. ● C. ● D. ● E. ●	
FA-BIOT09 <i>Describe the morphology and process of reproduction of microorganisms important in clinical disease and biotechnology applications</i>	A. Explain microbial taxonomy and classification systems and use them to identify microbial organisms B. Analyze how microorganisms are used in mass producing recombinant proteins C. Compare and contrast the use of plasmids in bacterial transformation and the process of plasmid DNA isolation and production decisions D. Compare and contrast bacterial, fungal, and animal cells and how these similarities and differences affect biotechnology product development E. Describe the structure of viruses and differentiate between types F. Explain how chemical energy operates major cell processes (e.g., biosynthesis, movement, transport, growth)	A. ● B. ● C. ●	D. ■ E. ■ F. ■
FA-BIOT10 <i>Identify techniques, trends, and current areas of research in biotechnology</i>	A. Describe and identify uses of the following techniques: recombinant DNA, genetic engineering, monoclonal antibody production, separation, and purification of biotechnology products and bioprocessing B. Predict how artificial intelligence, nanotechnology, bioinformatics, proteomics, genomics, and transcriptomics will create new career opportunities and impact healthcare environments		A. ■ B. ■

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-BIOT11 <i>Demonstrate the principles of solution preparation, sterile techniques, contamination control, and measurement and calibration of instruments used in biotechnology research</i>	A. Describe how molarity relates to solution preparation B. Calculate the molarity of a given solution and measure the pH of this solution C. Apply biosafety protocols in the laboratory environment D. Describe the criticality of the requirements of sterile techniques	A. ● B. ● C. ● D. ●	
FA-BIOT12 <i>Understand the biotechnology product development processes and regulations that affect those processes</i>	A. Analyze the role of pre-clinical and clinical trials in biotechnology product development B. Examine the role of a quality assurance person in this process C. Describe the role of agencies in promoting patient safety, quality control, and entrepreneurship D. Define current good manufacturing practices (CGMP) and why they are important in biotechnology production E. Diagram the process involved in making one biotechnology product in an industrial setting	A. ● B. ● C. ● D. ●	E. ■
FA-BIOT13 <i>Understand the ethical, moral, legal, and cultural issues related to the use of biotechnology research and product development</i>	A. Differentiate between morality and ethics and the relationship of each to biotechnology healthcare product development B. Articulate issues of ethical concern, including plagiarism, copyrights, trademarks, and patents and use online data resources and searchable databases to investigate a copyright, trademark, or patent C. Understand the critical need for ethical policies and procedures for institutions engaged in biotechnology research and product development D. Describe the dilemma of healthcare costs related to advancements in biotechnology and public access to treatments	A. ● B. ● C. ●	D. ■

Therapeutic & Diagnostic Services Knowledge and Skill Statements with Suggested Performance Indicators

Health sciences is a broad field with many entry points and career pathways. These knowledge and skill statements and suggested performance indicators may have different applications by industry sector.

-  **Foundational** - Basic skills that **should be taught** within high school or, if not feasible, at a partnering college
 **Intermediate** - Advanced skills **encouraged to be taught** within high school, with some offered at a partnering college

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-TD01 <i>Recognize the integrated systems approach to healthcare delivery services</i>	A. Understand the relationships between prevention, diagnosis, health condition, prognosis, and treatment procedures B. Describe the relationship and use of an integrated healthcare delivery system C. Illustrate the value of preventive and early intervention in relationship to healthcare practices D. Understand the significance of alternative approaches to healthcare in relationship to delivery systems E. Describe the importance of reimbursement systems in relationship to the delivery of patient care	A. 	B.  C.  D.  E. 
FA-TD02 <i>Recognize and practice components of an intake assessment relevant to patient care</i>	A. Identify and summarize major life events as they impact healthcare practices and patient outcomes B. Assess patient quality of life related to health condition(s) using standardized patient reported outcomes C. Identify patient healthcare needs, strengths, and problems D. Maintain patient confidentiality E. Conduct basic interview to acquire new knowledge (e.g., medical and family histories) F. Evaluate information gathered and connect patient data to appropriate system of care	A.  B.  C.  D. 	E.  F. 

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-TD03 <i>Assess the state of the patient and document using accurate medical terminology</i>	A. Identify factors affecting degree and quality of pain B. Use trauma-informed and cultural humility approaches to screen for mental-health and substance use disorders C. Keep written records as appropriate within facility policies and protocols D. Obtain and document vital signs E. Identify site, onset, type, quality, and degree of pain F. Determine when it may be necessary to refer patient to another healthcare provider	A. ● B. ● C. ●	D. ■ E. ■ F. ■
FA-TD04 <i>Use effective oral and written communication techniques when responding to patient questions and concerns</i>	A. Use sensitivity and withhold bias when communicating with patients B. Use active listening skills (e.g., reflection, restatement, and clarification) and communication techniques to gather information from the patient C. Observe and document the ability of patients to comprehend and understand information and determine how to adjust communication techniques D. Use appropriate strategies for interacting with and responding to patient questions and concerns E. Develop clearly written patient information and instructions F. Maintain written guidelines of the Health Insurance Portability and Accountability Act (HIPAA) in all communications	A. ● B. ● C. ● D. ● E. ● F. ●	
FA-TD05 <i>Understand that treatment/care plans must adhere to facility protocols, regulatory guidelines, and scope of practice</i>	A. Describe how a treatment/care plan might use a problem-solving model and incorporates patient input B. Identify the appropriate resources for implementing a treatment/care plan C. Evaluate priorities for treatment and/or referrals D. Understand basic care procedures within the scope of practice to assist with patient comfort	A. ● B. ●	C. ■ D. ■
FA-TD06 <i>Evaluate patient needs, strengths, and problems to determine if treatment/care goals are being met</i>	A. Consider patient goals and preferences during the development of a treatment/care plan B. Understand the need to assess follow-up and alternative options to a treatment/care plan C. Understand the need to revise or create modifications to treatment/care plan based on patient response to treatment D. Identify appropriate evaluation tools to assess patient response to treatment/care plan E. Describe how to document patient findings and report information appropriately	A. ● B. ● C. ●	D. ■ E. ■

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-TD07 <i>Use effective oral communication when communicating diagnostic information with departments and professionals</i>	A. Assess the appropriate communication techniques based on the individual ability to understand B. Apply active listening skills using reflection, restatement, and clarification C. Demonstrate courtesy to others, including self-introduction D. Interpret verbal and nonverbal behaviors to augment communication within scope of practice	A. ● B. ● C. ● D. ●	
FA-TD08 <i>Use effective written communication techniques when communicating patient health condition information with departments and professionals</i>	A. Report relevant information in a timely manner B. Distinguish between subjective and objective information when reporting C. Identify correct syntax and grammar appropriate to patient D. Analyze communication for appropriate response and provide feedback E. Organize, write, and compile technical information and summaries F. Use medical terminology to interpret, transcribe, and communicate information, data, and observations	A. ● B. ●	C. ■ D. ■ E. ■ F. ■
FA-TD09 <i>Understand the purpose of common diagnostic procedures</i>	A. Describe how common diagnostic procedures may be adjusted to prioritize patient and personal safety B. Document diagnostic results C. Understand how to communicate diagnostic results to healthcare team	A. ● B. ●	C. ■
FA-TD10 <i>Explain behavioral health assessments and treatments</i>	A. Explain how the Diagnostic and Statistical Manual of Mental Disorders (DSM) handbook and the American Society of Addiction Medicine (ASAM) criteria for substance use disorders are used in diagnosis and treatment in behavioral health B. Compare behavioral health assessment and treatment plans (e.g., ADHD, depression, anxiety) C. Describe the range of services including group and individualized therapy D. Describe theories and interventions being used in mental and social health (cognitive behavioral therapy [CBT], dialectical behavior therapy [DBT], creative arts therapy [CAT], emotionally focused therapy [EFT], solution-focused brief therapy [SFBT], and family therapy) E. Describe informed consent and how it impacts behavioral health F. Describe an individual treatment plan and its use	A. ● B. ● C. ● D. ● E. ● F. ●	

Health Informatics and Support Services Knowledge and Skill Statements with Suggested Performance Indicators

Health sciences is a broad field with many entry points and career pathways. These knowledge and skill statements and suggested performance indicators may have different applications by industry sector.

- **Foundational** - Basic skills that **should be taught** within high school or, if not feasible, at a partnering college
- **Intermediate** - Advanced skills **encouraged to be taught** within high school, with some offered at a partnering college

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-HISS01 <i>Understand healthcare systems as the organization of people, institutions, funding, and resources</i>	A. Recognize the resources necessary for a health system (e.g., financial, health informatics, diagnostic equipment, pharmaceuticals, and other therapeutic resources) B. Recognize the different general methods of funding healthcare (e.g., out-of-pocket payments, health insurance, government funding, charities) C. Recognize major specific payment systems (e.g., Medicare, Medicaid, Workers' Compensation) D. Understand common U.S. models for structuring healthcare funding (e.g., Health Maintenance Organizations [HMOs], Preferred Provider Organization [PPOs], Managed Care Organization [MCOs], and Independent Physician Association [IPAs]) E. Understand the specific roles and responsibilities of healthcare workers, including the healthcare administrative role of leadership for individuals and the organization within a variety of healthcare delivery systems F. Understand the relationships between healthcare providers, payers, and auditing organizations	A. ● B. ● C. ● D. ●	E. ■ F. ■
FA-HISS02 <i>Understand how to use health information effectively</i>	A. Recognize the major uses of health information (e.g., patient care, billing, research) B. Determine which data components are necessary for the successful completion of tasks C. Formulate and report information clearly and concisely	A. ● B. ● C. ●	

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-HISS03 <i>Use an electronic healthcare patient information system to optimize the acquisition, storage, retrieval, and use of information</i>	A. Understand how health information systems exchange data and stay updated B. Distinguish which type of documents must have hard copies retained, and which may be stored only in digital form C. Integrate information for timely, accurate dissemination	A. ● B. ● C. ●	
FA-HISS04 <i>Document, communicate, and maintain health information within legal and regulatory guidelines</i>	A. Select the systems and sources of information necessary for the successful completion of the task B. Assemble and accurately document required information C. Interpret health information that has been collected D. Differentiate the purposes and audiences for whom the information is collected E. Prepare and disseminate accurate documentation for various audiences within legal and regulatory requirements	A. ● B. ● C. ● D. ● E. ●	
FA-HISS05 <i>Communicate health information accurately and within legal and regulatory guidelines, upholding the strictest standards of confidentiality</i>	A. Evaluate how legal and regulatory requirements apply to the transfer of information B. Distinguish who in the organization needs information and when they need it C. Understand the laws and regulations regarding the transfer of information to a third party D. Determine which communication methods patients have approved and who they have approved to receive communications E. Manage recorded information and other documents in ways that ensure confidentiality and privacy F. Communicate information in a method that ensures confidentiality of content G. Communicate information on a need-to-know basis for optimum patient outcomes	A. ● B. ● C. ● D. ● E. ● F. ● G. ●	

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-HISS06 <i>Understand how to abstract and code information from medical records and documents using industry-standard methods of classification</i>	A. Understand medical record documentation (e.g., chart notes, injections, medications, lab reports) B. Interpret and extract information from medical records and documents C. Input and use health information applying management principles to ensure quality, compliance, and integrity D. Identify and apply accurate medical terminology E. Analyze and determine the need for requesting further clarification when transcribing/transferring information that may be unclear F. Assess and apply information for regulatory and legal purposes G. Assemble appropriate, accurate information including proper codes to record charges for reimbursement H. Complete common insurance claim forms ensuring federal, state, and third-party insurance reimbursements are included and complete payer compliance claim forms	A. ● B. ● C. ● D. ● E. ● F. ● G. ● H. ●	
FA-HISS07 <i>Demonstrate various decontamination techniques and procedures</i>	A. Demonstrate knowledge of standard precaution guidelines B. Select procedures and precautions to be followed when using chemicals C. Demonstrate techniques for mechanical and manual cleaning procedures D. Define chain of infection and provide strategies for how to break each part of the chain to prevent the spread of infection E. Evaluate potential causes and methods of transmitting infection F. Integrate infection control standards with relevant activities and procedures	A. ● B. ● C. ● D. ● E. ● F. ●	
FA-HISS08 <i>Employ best safety practices for handling hazardous materials and managing waste</i>	A. Develop a plan for monitoring hazardous waste disposal and recycling policies and procedures in accordance with regulatory requirements B. Assess the operations of a waste management program, including recycling and reduction of regulated medical, solid, hazardous chemical, and radioactive and biological waste materials C. Develop a plan to safely handle, package, store, and dispose of waste in accordance with federal, state, and local regulations D. Develop systems and procedures that minimize customer cost of ordering, storing, and using supplies, services, and equipment	A. ● B. ● C. ●	D. ■

Code and Knowledge and Skill Statement	Suggested Performance Indicators	Foundational	Intermediate
FA-HISS09 <i>Employ best safety practices for handling and storing a variety of materials common to the health services environment</i>	A. Demonstrate understanding of process and environmental requirements for proper handling and storage of sterile and non-sterile items B. Demonstrate appropriate inventory control and distribution systems C. Develop a plan to purchase materials, supplies, and capital equipment within allocated resources D. Recommend policies and procedures to monitor distribution, consumption, and pilferage of materials	A. ● B. ● C. ● D. ●	
FA-HISS10 <i>Utilize financial information and data to make appropriate decisions regarding purchase and maintenance of equipment and materials</i>	A. Explain competitive pricing, terms, and service levels B. Identify opportunities for reduction in resource consumption C. Evaluate purchasing processes and agreements D. Assess cost benefits that support best product recommendations	A. ● B. ●	C. ■ D. ■
FA-HISS11 <i>Apply principles and organizational protocols when acquiring and distributing equipment and materials</i>	A. Assess purchasing and procurement techniques to improve the overall supply chain B. Analyze timely order placement and supplier performance C. Assess a supplier's performance standards program D. Assess the integration of resource functions E. Evaluate distribution strategies and systems to ensure optimal materials flow F. Develop a plan to maintain adequate quantities of supplies, equipment, instruments, and medical devices	A. ● B. ● C. ● D. ● E. ● F. ●	