

# Dental Science

<b>Primary Career Cluster:</b>	Health Science
<b>Course Contact:</b>	<a href="mailto:CTE.Standards@tn.gov">CTE.Standards@tn.gov</a>
<b>Course Code(s):</b>	C14H21
<b>Prerequisite(s):</b>	<i>Health Science</i> (C14H14)
<b>Credit:</b>	1
<b>Grade Level:</b>	11-12
<b>Focus Elective Graduation Requirements:</b>	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Health Science courses.
<b>POS Concentrator:</b>	This course satisfies one out of two required courses to meet the Perkins V concentrator definition, when taken in sequence in the approved program of study.
<b>Programs of Study and Sequence:</b>	This is the second or third course in the <i>Therapeutic Services</i> program of study.
<b>Aligned Student Organization(s):</b>	HOSA: <a href="http://www.tennesseehosa.org">http://www.tennesseehosa.org</a>
<b>Coordinating Work-Based Learning:</b>	Teachers are encouraged to use embedded WBL activities such as informational interviewing, job shadowing, and career mentoring. For information, visit <a href="https://www.tn.gov/education/career-and-technical-education/work-based-learning.html">https://www.tn.gov/education/career-and-technical-education/work-based-learning.html</a>
<b>Promoted Tennessee Student Industry Credentials:</b>	Credentials are aligned with postsecondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit <a href="https://www.tn.gov/education/career-and-technical-education/student-industry-certification.html">https://www.tn.gov/education/career-and-technical-education/student-industry-certification.html</a>
<b>Teacher Endorsement(s):</b>	577, 720
<b>Required Teacher Certifications/Training:</b>	None
<b>Teacher Resources:</b>	<a href="https://www.tn.gov/education/career-and-technical-education/career-clusters/cte-cluster-health-science.html">https://www.tn.gov/education/career-and-technical-education/career-clusters/cte-cluster-health-science.html</a> Best for All Central: <a href="https://bestforall.tnedu.gov/">https://bestforall.tnedu.gov/</a>

## Course-at-a-Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21<sup>st</sup> century skills necessary to be successful in career and in life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards which feed into intentionally designed programs of study.

Students engage in industry relevant content through general education integration and experiences such as career & technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry standard content and technology, solve industry-based problems, meaningfully interact with industry professionals, and use/produce industry specific, informational texts.

### Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for your students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course, note this is not an exhaustive list.

- Participate in CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry specific skills that involve teamwork and project management
- Participate in contests that highlight job skill demonstration; interviewing skills; community service activities, extemporaneous speaking, and job interview
- Participate in leadership activities such as Organizational Leadership, Prepared Speaking, HOSA Service Project, Creative Problem Solving, and HOSA Service Project.

For more ideas and information, visit Tennessee HOSA at <http://www.tennesseehosa.org/>

### Using Work-based Learning in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standards 1.1-1.3** | Conduct informational interviews with various members of the dental care team to analyze skills, competencies, and professional traits of dental health professionals.
- **Standards 2.1-2.4** | Job shadow at a free dental clinic to focus on cost and services for dental care.
- **Standards 3.1-3.5** | Job shadow a dental hygienist and practice filling out the tooth numbering chart.
- **Standards 4.1-4.2** | Invite a TOSHA representative to discuss chemical safety and hazardous wastes in dental facilities.
- **Standards 5.3** | Partner with a dental health professional to create an age-specific dental health education plan for patients.
- **Standards 6.1-6.3** | Observe an in-office oral surgery procedure

For more ideas and information, visit <https://www.tn.gov/education/career-and-technical-education/work-based-learning.html>.

## Course Description

*Dental Science* is an applied course in the *Therapeutic Services* program of study intended to prepare students with an understanding of the roles and responsibilities of the dental health care professional within the application of dental care. Upon completion of this course, proficient students will be able to differentiate the many careers in dentistry, assess, monitor, evaluate, and report on the dental health of patients/clients and relate this information to overall health, apply appropriate dental terminology, and perform clinical supportive skills. In addition, students will continue to build a health science career portfolio that will follow them throughout their chosen program of study.

## Program of Study Application

This is the second or third applied course in the *Therapeutic Services* program of study. For more information on the benefits and requirements of implementing this program in full, visit the Health Science website at <https://www.tn.gov/education/career-and-technical-education/career-clusters/cte-cluster-health-science.html>

## Course Standards

### 1. Careers in Dental Science

- 1.1 History of dentistry and dental care: Gather relevant information from textbooks and online searches concerning the history of dentistry, with emphasis on changes in care and prevention to understand how the practice of dentistry has evolved. Research emerging dental technologies related to dental and oral health, including but not limited to procedures, equipment, and diagnostics tools.
- 1.2 Dental careers: Research careers within the dental sciences and explain the educational/credentialing requirements, as well as state and national compliance guidelines required of health care professionals. Include other branches of dentistry such as Orthodontics and Endodontics.
- 1.3 Required professional traits for dental careers: Analyze the **range of skills, competencies, and professional traits (such as leadership, time management, and ethical responsibility) required for careers in dental sciences**. Using real-time and projected labor market data, identify **local and national employment opportunities** and determine areas of growth. Complete a job application, resume, and cover letter for one of the jobs located in the search.

### 2. Legalities and Ethical Issues

- 2.1 Ethical issues: Investigate **ethical issues affecting dental health professionals**, such as leaving fluoride out of drinking water, the practice of dental tourism, or the affordability of dental care among vulnerable populations like the elderly. Discuss **how these issues will affect or have affected the dental community**.

- 2.2 Legal responsibilities: Examine the **legal responsibilities of dental professionals** when treating patients/clients with diseases or disorders related to infections transmitted sexually or through drug use, domestic violence, neglect, and child abuse.
- 2.3 Cultural differences: Compare and contrast the **dental care and prevention customs** and cultural beliefs of various populations. Examples might include soaking a cotton ball in turpentine for tooth pain relief or using bleach to whiten teeth. Explain **how these customs either enhance or diminish the outcomes of dental care treatments and procedures**.
- 2.4 Dental insurance coverage: Compare and contrast the **average cost of private dental insurance plans versus government-issued plans**. Analyze the **cost for both pediatric and adult patients for treatments** such as a routine dental visit, a visit that requires fillings, and a visit that requires tooth extraction. Role-play **therapeutic communication** utilizing correct dental terminology to explain the cost with a classmate and/or family member.

### 3. Anatomy and Physiology

- 3.1 Dental terminology: Outline the gross and cellular structure and function of head and neck anatomy, including bones, muscles, sinuses, salivary glands, nerves, and blood vessels using appropriate dental terminology.
- 3.2 Embryonic development of the head, oral cavity, and teeth: Research and highlight the stages of **embryonic development of the head, oral cavity, and teeth**. Examine the **environmental and genetic factors affecting embryonic development**, differentiating between normal and abnormal findings using dental and medical terminology.
- 3.3 Tooth anatomy and health practices: Analyze the **parts and functions of teeth**. Include the **effects of nutrition on tooth development** and continuous good health and dental prevention care.
- 3.4 Universal dental numbering system: Compare and contrast the **FDI World Dental Federation, the Universal Numbering System, and the Palmer dental notation systems**. Number the teeth located in the human dentition on a model or chart.
- 3.5 Dental health diseases and disorders: Choose a **dental health disease or disorder**. Examples might include dental caries in babies who drink juices from a bottle or oral cancer in smokeless tobacco users. Discuss the scope of the disease/disorder, affected and vulnerable populations, local incidence information as compared to state, region, and national data, existing practices that target the disease/disorder, and interventions available.

#### 4. Microbiology, Infection Control, and Disease Prevention

- 4.1 Microorganisms related to dental disease: Define the **terms pathogenic and non-pathogenic as they relate to microorganisms** and explain how each can cause a **dental disease or disorder**. Outline **modes of transmission and prevention of the spread** of these organisms. Investigate oral manifestations related to pathogenic and non-pathogenic organisms. Analyze concepts of disinfection, OSHA standards, and use of Personal Protective Equipment (PPE) to prevent spreading of disease to dental staff.
- 4.2 Hazardous wastes in dental facilities: Differentiate among **toxic, corrosive, ignitable, and reactive hazardous wastes in dental facilities**. Discuss the role of the **Material Safety Data Sheets (MSDS)** in identifying hazards associated with specific chemicals or chemical compounds by evaluating MSDS information. Describe the **characteristics of the most common chemicals and compounds found in the dental office**.

#### 5. Dental Examinations

- 5.1 Dental assistant skills: Understand principles of and successfully perform skills related to Dental Assisting, incorporating rubrics from textbooks or clinical standards of practice for the following:
- Operatory preparation for treatment and receiving of the patient
  - Positioning of the patient and the clinician
  - Radiographic process and patient/operator protection
  - Oral prophylaxis
- 5.2 Dental office instruments: Identify **basic dental office instrumentation** and explain the **purpose of each item**. Role-play a **scenario based in a dental office that uses at least five instruments accurately**, including patient assessment, procedure for operatory preparation of the patient room, receiving and seating the patient, and providing at least one treatment.
- 5.3 Dental disease prevention: Develop a **patient health education plan** including preventive measures, signs and symptoms of exacerbation of disease/disorder/injury, pharmacological needs, and support systems.
- 5.4 Impending/developing dental emergencies: Summarize the **signs and symptoms of impending or developing dental emergencies**, citing environmental, medical, and hygienic factors that may contribute to the condition. Evaluate an **office emergency policy and procedure** that outlines the responsibilities and actions of each healthcare worker.
- 5.5 Cardiopulmonary resuscitation: Complete training in American Heart Association or American Red Cross **Cardiopulmonary Resuscitation (CPR)**. Students should be certified in

either American Heart Association Heartsaver CPR or BLS for Healthcare Provider -or- Red Cross Adult and Pediatric CPR or Healthcare Provider CPR prior to clinical rotation.

## 6. Dental Procedures and Specialties

6.1 Dental procedures: Follow **medical procedures** precisely when performing **patient/client skills** in a classroom or clinical setting related to the role of the Dental Assistant, including:

- a. Complete health/dental history
- b. Perform vital signs
- c. Coronal polishing
- d. Fluoride treatment
- e. Preparation of restorative materials
- f. Preparing and alginate impression
- g. Cleaning and sterilizing equipment
- h. Patient and/or community education on oral health
- i. Document findings and procedure in a recognized format for a dental facility using correct dental terminology

6.2 Dental treatment plan: Incorporate medical/dental language in the development of a **detailed dental treatment plan for a case study or live patient**, describing goals and objectives, medications, and/or alternative treatment and coping mechanisms, and incorporating applicable assessment information following interview/assessment of a patient or family member.

6.3 Dental specialty procedures: Research a **dental specialty procedure** (such as oral surgery, prosthetic dentistry, or gingivoplasty), then develop a written or verbal explanation of the procedure using correct dental terminology. Include at minimum the purpose of the procedure, average cost, documented benefits and potential side effects, and profile of the dental professional that performs the procedure.

### The following will reside in the student's portfolio:

- a. Standard 8 Research artifact
- b. Standard 9 Health education project
- c. Standard 19 CPR certificate
- d. Standard 20 Skills check lists

## Standards Alignment Notes

\*References to other standards include:

- American Red Cross BLS CPR Guidelines. <http://www.redcross.org/>.
- American Heart Association BLS Guidelines. <http://www.heart.org/HEARTORG/#>.
- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
  - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.

## **Additional Notes**

\*\*Informational artifacts include, but are not limited to, brochures, posters, fact sheets, narratives, essays, and presentations. Graphic illustrations include, but are not limited to, charts, graphs, rubrics, drawings, and images.