

<b>Head and Neck Anatomy</b>			
<b>DH 109</b>			
<b>Date revised and approved: April 2022</b>			
<b>Academic Level</b>  01	<b>Course Type</b>  Theory	<b>Total Classroom Hours</b>  22	<b>Educators</b>  Mr. Alex Metersky Email: ametersky@cadh.ca
<b>Course Pre-requisites</b>  none		<b>Course Co-requisites</b>  DH 101, DH 102, DH 103, DH 105, DH 106, DH 108, DH 113	

### ***Course Description***

This course introduces the student to basic knowledge of the anatomical and physiological features of the head and neck region. This course correlates and is presented concurrently with Human Anatomy, Physiology, and Pathophysiology. The student is encouraged to link concepts between courses. Topics covered include; basic terminology, surface landmarks, bones of the head and neck, muscles, temporomandibular joint, endocrine and exocrine glands, nerves, lymphatics and the spread of infection. Furthermore, the student will learn the clinical application of these topics as they pertain to the dental hygiene process of care. Upon completion of this course the student will demonstrate professionalism by taking responsibility for learning, and through collaboration with peers.

**Students, it is your responsibility to retain course outlines for possible future use to support applications for transfer of credit to other educational institutions or to substantiate specific educational learning outcomes for professional recognition.**

## **Learning Resources**

### *Required Texts:*

Fehrenbach MJ, Herring SW. Illustrated Anatomy of The Head and Neck, 6<sup>th</sup> ed. Philadelphia, PA: Saunders; 2020.

## **Teaching/Learning Methods and Activities**

During this course you are likely to experience lectures, Discussions, slide presentations and laboratory exercises.

**Staff/student ratio: 1/42**

## **Class Attendance and Participation Expectations**

The acquisition of dental hygiene theory is important for sound dental hygiene practice. Therefore, **attendance is mandatory** and students are expected to participate in a mature and respectful manner during all classroom activities. There are no unexcused absences. Students unable to attend should immediately (at least one hour prior to the start of the session) notify CADH at **905-278-2794**. This number provides a 24-hour message system. A **medical certificate** is required for absences and must be provided to the faculty member upon your return to school.

Students that miss more than ten percent of any course must meet with the course instructor to review their progress in the course. A student that exceeds the maximum number of allowed absences will **fail** the course and must repeat that course, regardless of the quality of the work they have demonstrated in the course.

## **Missed Course Activities**

Students are expected to complete all classroom activities (tests, labs, presentations, assignments, exams, etc.) at the scheduled time. A score of zero will be given for any missed work unless there are exceptional situations. The faculty member responsible for the course will decide whether the student merits the opportunity to make up the missed activity. Please refer to the student handbook under “Policy Regarding Missed Course Activities” to review the details of this policy.

## Accessing Course Materials through the Learning Management System

CADH has adopted Evolve, a publisher based (Elsevier) Learning Management System (LMS). The student site is accessible at <https://evolve.elsevier.com/cs/store?role=student>. This system is user friendly and provides access to support for students via email, telephone, or live internet chat. Please note that support is available Monday through Friday and Sunday; details on hours and how to access support can be found at Evolve Support.

As a student, you will be expected to be enrolled in the course. Your faculty may enrol you in the course, in which case, you will receive an email indicating this. Otherwise, if advised by the faculty member, you will be expected to self-enrol in the course by:

- Going to: <https://evolve.elsevier.com/cs/studentEnroll.html>
- In the course ID box, entering the code provided by your faculty member: <course code>, hitting enter
- In the next screen, confirming the course is the correct one by checking the name and number and then clicking on the button 'Register'
- Following the steps to complete registration process.

Faculty members will post course announcements, course materials and any supplemental materials on the LMS for you to access and review. It is your responsibility to check the course site on a daily basis for any updates to the course material. In addition, the faculty member may email you from the site, require you to complete online components such as blogs, discussions, and assignments, as well as post grades using this site.

## Evaluation

Students will be evaluated in this course by tests and an examination, as outlined in the chart below. Students will have 6 online pre-and post quizzes, as outlined in the course schedule. Students will be expected to complete each pre quiz prior to the start of the class in order to receive a 1% participation grade. Student will also be provided 5 days after the class to complete the post class quiz and will receive a maximum of 5%, based on the students score on the quiz. The grades received on the best 5 quizzes will be used towards the student's final grade.

<i>Grading System</i>				<i>Marks Assignment</i>	
A+	90 – 100	C+	67 – 69		% of final grade
A	85 – 89	C	63 – 66	Test 1	30
A-	80 – 84	C-	60 – 62	Online Quizzes* (5x6%)	30
B+	77 – 79	F	59 and below	Final Exam	40
B	73 – 76			<b>Total</b>	<b>100</b>
B-	70 – 72				

\*total 6 quizzes will be given and the best 5 will be counted towards the final grade

## Course Content

### Course Learning Outcomes and Embedded Knowledge and Skills

Upon completion of this course the student will be able to:		
Course Learning Requirements		Embedded Knowledge and Skills
1. Explain the relevance of the study of head and neck anatomy and physiology to dental hygiene practice	1.1 Use the appropriate anatomical nomenclature	<ul style="list-style-type: none"> <li>▪ Recall the terms: anatomical position, anterior, posterior, ventral, dorsal, inferior, superior, apex, median plane, sagittal plane, frontal plane, horizontal plane, median, medial, proximal, lateral, distal, deep, internal, deep, external, ipsilateral, contralateral, superficial, and transverse section</li> </ul>
	1.2 Discuss how the head is divided into regions	<ul style="list-style-type: none"> <li>▪ Name, locate, and identify associated surface landmarks of the following regions of the head:               <ul style="list-style-type: none"> <li>- Frontal                      - Orbital                      - Nasal</li> <li>- Parietal                      - Mental                      - Oral</li> <li>- Occipital                      - Temporal                      - Buccal</li> <li>- Infraorbital                      - Zygomatic</li> </ul> </li> <li>▪ Name, locate, and identify the regions of the neck</li> </ul>
	1.3 Discuss landmarks that can be found in the skeletal system	<ul style="list-style-type: none"> <li>▪ Define the terms associated with bony prominences:               <ul style="list-style-type: none"> <li>- Crest                      - Line                      - Head</li> <li>- Cornu                      - Tubercle                      - Arch</li> <li>- Eminence                      - Process                      - Spine</li> <li>- Tuberosity                      - Condyle</li> </ul> </li> <li>▪ Define the terms associated with bony depressions:               <ul style="list-style-type: none"> <li>- fossa                      - sulcus                      - Incisura or notch</li> </ul> </li> <li>▪ Define the terms associated with bony openings:               <ul style="list-style-type: none"> <li>- Ostium                      - Canal                      - Meatus</li> <li>- Foramen                      - Fissure                      - Aperature</li> </ul> </li> <li>▪ Differentiate between an articulation and suture</li> </ul>

<b>Upon completion of this course the student will be able to:</b>		
<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
1. Explain the relevance of the study of head and neck anatomy and physiology to dental hygiene practice	1.4 Explain how knowledge of the head and neck region will be integrated into clinical practice to assess, plan, and provide dental hygiene care	<ul style="list-style-type: none"> <li>▪ Discuss clinical applications of the study of head and neck anatomy by dental professionals</li> <li>▪ Discuss the difference between normal and abnormal in the head and neck region and ensure follow-up examination</li> </ul>
2. Examine the bones of the skull	2.1 Locate and describe the bones of the skull	<ul style="list-style-type: none"> <li>▪ Recognize the 22 bones in the skull</li> <li>▪ Describe how the bones of the skull are divided</li> <li>▪ Identify the boundaries of the three cranial fossae and describe what lies within them</li> <li>▪ Locate and identify the bones of the head and neck and their landmarks on a skull, student partner and diagram</li> </ul>
	2.2 Examine the bones of the neurocranium and their associated structures	<ul style="list-style-type: none"> <li>▪ Identify the various bones and sutures of the neurocranium as seen from the anterior, lateral, posterior, inferior and interior views of the skull:               <ul style="list-style-type: none"> <li>- Occipital bone</li> <li>- Frontal bone</li> <li>- Parietal bones</li> <li>- Temporal bones</li> <li>- Sphenoid bone</li> <li>- Ethmoid bone</li> </ul> </li> <li>▪ Describe the pterygoid processes of the sphenoid bone and their components</li> </ul>

<b>Upon completion of this course the student will be able to:</b>		
<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
2. Examine the bones of the skull	2.3 Examine bones of the viscerocranium and their associated structures	<ul style="list-style-type: none"> <li>▪ Identify the various bones and sutures of the viscerocranium as seen from the anterior, lateral, posterior, inferior and interior views of the skull:               <ul style="list-style-type: none"> <li>- Mandible</li> <li>- Vomer</li> <li>- Nasal bones</li> <li>- Lacrimal bones</li> <li>- Zygomatic bones</li> <li>- Inferior nasal conchae</li> <li>- Palatine bones</li> <li>- Maxillae</li> </ul> </li> <li>▪ Explain in detail the various landmarks of the maxillae</li> <li>▪ Explain in detail the various landmarks of the mandible</li> </ul>
	2.4 Examine the anatomy of the nose, nasal cavity and paranasal sinuses.	<ul style="list-style-type: none"> <li>▪ Define nose, nasal cavity and paranasal sinuses.</li> <li>▪ Explain the function of the nasal cavity, nasal epithelium and paranasal sinuses.</li> <li>▪ Outline the anatomic relationship of the maxillary sinus and the maxillary teeth.</li> <li>▪ Outline the relationship of the maxillary teeth to the maxillary sinus in infections of either one.</li> <li>▪ Identify and locate the nasal cavity and paranasal sinuses on a skull, student partner, and diagram</li> </ul>

<b>Upon completion of this course the student will be able to:</b>		
<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
3. Examine the muscles of the head and neck	3.1 Explain the function of the cervical muscles	<ul style="list-style-type: none"> <li>Describe the origin, insertion, action, and innervations of the sternocleidomastoid and trapezius muscles</li> </ul>
	3.2 Describe how muscles are involved in facial expression	<ul style="list-style-type: none"> <li>Recognize muscles involved in facial expressions such as demonstrating surprise, frowning, chewing, smiling, frowning, grimacing, closing the eyelids</li> <li>Describe the origin, insertion, action, and innervation of the muscles of facial expression in the following regions:               <ul style="list-style-type: none"> <li>Ears                      – Neck                      – Nose</li> <li>Scalp                      – Eyes                      – Mouth</li> </ul> </li> <li>Discuss the role of the buccinator muscle in mastication</li> </ul>
	3.3 Examine the muscles of mastication and their role	<ul style="list-style-type: none"> <li>Identify the muscles of mastication               <ul style="list-style-type: none"> <li>Masseter</li> <li>Temporalis</li> <li>Medial pterygoid</li> <li>Lateral pterygoid</li> </ul> </li> <li>Describe the process of mastication</li> <li>Describe the origin, insertion, action, and innervation of the muscles of mastication</li> <li>Categorize the muscles according to their role in elevation, depression, protrusion, retrusion, and lateral excursion of the mandible</li> <li>Identify and locate the muscles of mastication on a student partner, and diagram</li> </ul>

Upon completion of this course the student will be able to:		
Course Learning Requirements		Embedded Knowledge and Skills
3. Examine the muscles of the head and neck	3.4 Explain the role of the hyoid muscles in mastication and swallowing	<ul style="list-style-type: none"> <li>▪ Identify the hyoid muscles</li> <li>▪ Categorize the muscles, based on their relationship to the hyoid bone into suprahyoid and infrahyoid</li> <li>▪ Describe the origin, insertion, action, and innervation of the hyoid muscles               <ul style="list-style-type: none"> <li>- Digastric</li> <li>- Mylohyoid</li> <li>- Stylohyoid</li> <li>- Geniohyoid</li> <li>- Omohyoid</li> <li>- Thyrohyoid</li> <li>- Sternohyoid</li> <li>- Sternothyroid</li> </ul> </li> <li>▪ Describe the origin, insertion, action, and innervations of the hyoid muscles</li> </ul>
	3.5 Explain how muscles are involved in the movement of the tongue	<ul style="list-style-type: none"> <li>▪ Identify the muscles of the tongue</li> <li>▪ Differentiate between the extrinsic and intrinsic tongue muscles               <ul style="list-style-type: none"> <li>- Vertical</li> <li>- Transverse</li> <li>- Hyoglossus</li> <li>- Styloglossus</li> <li>- Genioglossus</li> <li>- Superior longitudinal</li> <li>- Inferior longitudinal</li> </ul> </li> <li>▪ Describe the origin, insertion, action, and innervation of the muscles of the tongue</li> </ul>
	3.6 Explain the role of the muscles of the pharynx in speech and swallowing	<ul style="list-style-type: none"> <li>▪ Name and describe the muscles that constitute the muscles of the pharynx               <ul style="list-style-type: none"> <li>- Uvula</li> <li>- Palatoglossal</li> <li>- Palatopharyngeal</li> <li>- Tensor veli palatini</li> <li>- Levator veli palatini</li> <li>- Pharyngeal constrictors</li> <li>- Pharyngeal elevators and dilators</li> </ul> </li> </ul>



<b>Upon completion of this course the student will be able to:</b>		
<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
4. Examine the muscles of the head and neck	3.6 Explain the role of the muscles of the pharynx in speech and swallowing	<ul style="list-style-type: none"> <li>Describe the origin, insertion, action, and innervation of the muscles of the pharynx</li> <li>Describe the interrelationship of all these muscles in chewing swallowing and speech</li> </ul>
4. Examine the movement and function of the temporomandibular joint (TMJ)	4.1 Outline the composition of the TMJ	<ul style="list-style-type: none"> <li>Define joint</li> <li>Identify and describe the bones that form the TMJ</li> <li>Describe how the TMJ bones articulate</li> <li>Describe the structure of the joint capsule</li> <li>Describe the location, shape and attachments of the disc (meniscus) of the joint</li> <li>Outline the role of the synovial cavity</li> <li>Name and describe the function of the ligaments associated with the TMJ</li> <li>Identify and locate the parts of the TMJ on a skull, student partner, and diagram</li> </ul>
	4.2 Explain the movement of the TMJ	<ul style="list-style-type: none"> <li>Differentiate between the two movements of the TMJ</li> <li>Recognize the bones and muscles involved in each of these two movements</li> <li>Relate the mandibular and TMJ movements with their associated muscles</li> </ul>
	4.3 Examine temporomandibular disorders (TMD) and the role of the dental hygienist in their detection	<ul style="list-style-type: none"> <li>Explain the probable causes of TMJ pain</li> <li>Explain subluxation, bruxism, TMJ sounds, and disc derangement</li> <li>Describe bilateral palpation of the TMJ</li> <li>Outline the signs and symptoms associated with TMD</li> <li>Outline the treatment options for TMD</li> </ul>

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<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
5. Examine the vascular system of the head and neck region	5.1 Outline and describe the arterial blood supply to the head and neck region	<ul style="list-style-type: none"> <li>Trace the blood supply from the heart to all areas of the oral cavity, including the teeth</li> <li>Identify the 2 divisions of the common carotid artery</li> <li>Identify and locate the major arterial vessels on a skull, student partner, and diagram</li> </ul>
	5.2 Outline and describe the venous drainage of the head and neck region	<ul style="list-style-type: none"> <li>Trace the venous drainage from the teeth and oral cavity back to the heart</li> <li>Identify and locate the major venous vessels on a skull, student partner, and diagram</li> </ul>
	5.3 Describe the types of vascular lesions that can occur in the head and neck region	<ul style="list-style-type: none"> <li>Define hematoma</li> <li>Explain the possible problems associated with a posterior superior alveolar injection</li> </ul>
6. Examine glandular tissue found in the head and neck region	6.1 Classify glandular tissue appropriately	<ul style="list-style-type: none"> <li>Define gland and duct</li> <li>Differentiate between exocrine and endocrine gland and provide examples of each</li> </ul>
	6.2 Explain the role of the lacrimal glands in the lubrication of the eyes	<ul style="list-style-type: none"> <li>Describe the number, location, blood supply, drainage, and innervations of the lacrimal glands</li> <li>Outline the role of the nasolacrimal sac and nasolacrimal duct</li> </ul>

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<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
6. Examine glandular tissue found in the head and neck region	6.3 Explain the role of the salivary glands in lubrication of the oral cavity	<ul style="list-style-type: none"> <li>▪ Differentiate between major and minor salivary glands</li> <li>▪ Name and locate each of the major and minor glands</li> <li>▪ Classify each of the glands according to type of secretion</li> <li>▪ Identify the ducts associated with each salivary gland</li> <li>▪ Describe the function of saliva</li> <li>▪ Identify and locate the major salivary glands on a skull, student partner, and diagram</li> </ul>
	6.4 Examine the parathyroid gland and thymus gland and their function	<ul style="list-style-type: none"> <li>▪ Explain the location, innervation, and function of the parathyroid gland</li> <li>▪ Explain the location, innervation, and function of the thymus</li> </ul>
7. Examine the nervous system and its role in the head and neck region	7.1 Relate knowledge of the anatomical components of the nervous system to function in the oral cavity	<ul style="list-style-type: none"> <li>▪ Recall the basic components of the nervous system</li> <li>▪ Describe the general makeup of a spinal nerve</li> <li>▪ Describe how a sensory impulse carries a motor response</li> <li>▪ Describe the components and general function of the autonomic nervous system</li> </ul>
	7.2 Discuss the cranial nerves found in the head and neck region	<ul style="list-style-type: none"> <li>▪ Name the 12 cranial nerves and their general function</li> </ul>

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<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
7. Examine the nervous system and its role in the head and neck region	7.3 Examine the trigeminal nerve (V) and its branches	<ul style="list-style-type: none"> <li>▪ Name the specific branches of trigeminal nerve (V):               <ul style="list-style-type: none"> <li>- V1</li> <li>- V2</li> <li>- V3</li> </ul> </li> <li>▪ Name the specific branches of the trigeminal nerve and which areas of the face, teeth, and oral cavity each branch supplies</li> </ul>
	7.4 Locate the dental injection sites associated with the trigeminal nerve.	<ul style="list-style-type: none"> <li>▪ Identify the local anaesthetic target areas and injection sites</li> <li>▪ Relate each injection site to the appropriate division of the trigeminal nerve</li> <li>▪ Identify teeth and tissue associated with each injection site</li> <li>▪ Describe symptoms and possible complications associated with each injection</li> <li>▪ Identify and locate the injection sites on a skull, and diagram</li> </ul>
	7.5 Examine innervations of the tongue and salivary glands	<ul style="list-style-type: none"> <li>▪ Examine the nerves and areas involved with special sensation of the tongue</li> <li>▪ Examine the nerves and pathways involved in parasympathetic innervation to the major salivary glands</li> </ul>
8. Examine the lymphatic system and its role in the head and neck region.	8.1 Discuss the lymphatic system and its components	<ul style="list-style-type: none"> <li>▪ Explain the function of the lymphatic system</li> <li>▪ Identify and assess the components of the lymphatic system</li> </ul>

<b>Upon completion of this course the student will be able to:</b>		
<b>Course Learning Requirements</b>		<b>Embedded Knowledge and Skills</b>
8. Examine the lymphatic system and its role in the head and neck region.	8.2 Examine the patterns of lymphatic drainage	<ul style="list-style-type: none"> <li>▪ Define the terms primary, secondary, and tertiary nodes of involvement as they relate to lymphatic drainage</li> <li>▪ Name the primary lymph drainage of all the teeth</li> <li>▪ Trace, on a diagram, the major groups of lymph nodes that drain the teeth and oral cavity</li> </ul>
	8.3 Examine the role of tonsillar tissue	<ul style="list-style-type: none"> <li>▪ Explain the function of the tonsillar tissue</li> <li>▪ Identify and locate tonsillar tissue on a diagram</li> </ul>
9. Examine the various methods that facilitate the spread of infection.	9.1 Discuss pathophysiology of the lymph nodes	<ul style="list-style-type: none"> <li>▪ Describe and discuss lymphadenopathy</li> <li>▪ Discuss the spread of cancer in the head and neck region and its relationship to lymph nodes</li> </ul>
	9.2 Explain the role of fascial spaces in the head and neck region and their link to the spread of infection	<ul style="list-style-type: none"> <li>▪ Identify and locate the fasciae of the head and neck on a diagram, skull, and student partner</li> <li>▪ Identify and locate the major spaces of the head and neck on a diagram, skull, and, student partner</li> <li>▪ Outline communication between the major spaces of the head and neck</li> <li>▪ Explain how fascial space infection may spread from the oral cavity to the thorax</li> <li>▪ Define Ludwig's angina</li> </ul>

## Course Schedule

Week	Hours	Course Learning Requirement/Topic	Resources
13	2		
14	2		
15	2		
16	2		
17	2		
18	2		
19	2		
20	2		
21	2		
22	2		
23	2		