

# DHYG 1000 Tooth Anatomy and Root Morphology COURSE SYLLABUS Fall Semester 2018

#### **COURSE INFORMATION**

Credit Hours/Minutes: 2 Semester Credit Hours/2250 minutes

Campus/Class Location: Vidalia/Health Sciences Annex C, Room #906

Class Meets: Tuesdays 9:10-11:30am Course Reference Number (CRN): 20287

#### **INSTRUCTOR CONTACT INFORMATION**

Course Director: Lori DeFore, RDH, BS, BTh

Email Address: Lori DeFore (Idefore@southeasterntech.edu)

Campus/Office Location: Vidalia/Health Sciences Annex C, Room #909

Office Hours: Mondays: 7:30-8:30am; 5:00-5:30pm; Tuesdays: 7:30-8:00am; 12:00-5:30pm; Wednesdays:

7:30-8:00am; 10:00-10:30am; 5:00-5:30pm; Thursdays: 7:30-8:30am

Phone: 912-538-3251 Fax Number: 912-538-3278

#### SOUTHEASTERN TECHNICAL COLLEGE'S (STC) CATALOG AND HANDBOOK

Students are responsible for all policies and procedures and all other information included in Southeastern Technical College's <a href="Catalog and Handbook">Catalog and Handbook</a> (<a href="http://www.southeasterntech.edu/student-affairs/catalog-handbook.php">http://www.southeasterntech.edu/student-affairs/catalog-handbook.php</a>).

#### **REQUIRED TEXTS**

- 1. Illustrated Dental Embryology, Histology, and Anatomy, Fourth edition. Fehrenbach and Popowics. Elsevier/ Saunders. 2015
- 2. Student Workbook for Illustrated Dental Embryology, Histology and Anatomy, Fourth edition. Fehrenbach and Popowics. Elsevier/ Saunders. 2015

#### **REFERENCE TEXT & IPAD/IPHONE APPS**

- 1. STC Dental Hygiene Program Clinic Manual
- 2. FREE IPAD/IPHONE APPS: Bonebox Dental and Real Tooth Morphology
- 3. Clinical Practice of the Dental Hygienist, 12<sup>th</sup> edition. Wilkins. 2016. Wolters Kluwer.

#### **REQUIRED SUPPLIES & SOFTWARE**

Notebook, notebook paper, black pen, colored pencils: red, blue, and green.

Students should not share login credentials with others and should change passwords periodically to maintain security.

#### **COURSE DESCRIPTION**

This course provides the student with a thorough knowledge of external and internal morphological characteristics of human primary and secondary dentition. It also introduces the student to various tooth identification systems, classifications of occlusion, and dental anomalies. Topics include: oral cavity anatomy, dental terminology, external and internal tooth anatomy, tooth nomenclature and numbering systems, individual tooth and root morphology, occlusion, and dental anomalies.

#### **MAJOR COURSE COMPETENCIES (CC)**

- 1. Oral Cavity Anatomy
- 2. Dental Terminology
- 3. External and Internal Tooth Anatomy
- 4. Tooth Nomenclature and Numbering Systems
- 5. Individual Tooth and Root Morphology
- 6. Occlusion
- 7. Dental Anomalies

#### PREREQUISITE(S)

**Program Admission** 

# **COREQUISITE(S)**

None

#### **GENERAL EDUCATION CORE COMPETENCIES (GC)**

Southeastern Technical College has identified the following general education core competencies that graduates will attain:

- 1. The ability to utilize standard written English.
- 2. The ability to solve practical mathematical problems.
- 3. The ability to read, analyze, and interpret information.

# STUDENT REQUIREMENTS

Students are responsible for the policies and procedures in the Southeastern Technical College (STC) Catalog and Handbook, Dental Hygiene Program Handbook, and Dental Hygiene Clinic Manual. During an examination, the following procedures must be followed: All books and personal belongings must be placed at the back of the classroom. Students will be asked to rotate seats prior to the beginning of the test. Test proctor will personally examine each desk to ensure that no writing is present on desk. Computer monitors should be facing the front of the classroom during test. When a student completes the test, he/she may raise hand and turn paper in to proctor. Student must remain in seat until test time is complete to avoid distracting other students. Students who have completed testing should be as quiet as possible and avoid any activity that might make those students who are still testing feel pressured or rushed. Students may not go to the bathroom during the test session. Test proctor must observe students at all times and notify students when there are ten remaining minutes left of the total exam time. Test proctor should routinely walk around classroom and observe testing. Test proctor should refrain from grading papers, reading materials, or using computer during the test. Students caught with cheat sheets or cell phones will be considered cheating and a

zero will be issued for the examination. The STC academic dishonesty policy will be enforced. Once the test begins, no talking is allowed. Once the test begins, tardy students may not enter the classroom.

Students are expected to exhibit professional behavior at all times. Each student must show respect and concern for fellow students and for the course instructors. Insubordination will not be tolerated, and disciplinary measures will be enacted. No cell phones or smart electronic devices are allowed to be turned on in the classroom, clinic, or locker area. If a student is observed in possession of his/her cell phone or smart electronic device during class, a critical incident will be issued. A student cannot use his/her cell phone or smart electronic device during class. There are no exceptions to this rule and do not ask. If you have a personal situation going on, please advise your instructor and give your family the clinic receptionist's phone number for emergency contact. You should not have your cell phone or smart electronic device in the class! Personal phone calls must be handled after class.

By completing the assignments below prior to class, students will become familiar with course material prior to classroom facilitation. As a result, higher-level learning will be fostered in the classroom.

- 1. Read the assigned chapter(s) and be prepared to actively participate in class discussions and activities.
- 2. Answer/complete all case study exercises in the chapter review section for each session, if applicable.
- 3. Know the definitions of chapter key terms.
- 4. Highlight National Board Exam material in relevant chapter(s) prior to class.
- 5. Complete any assignments or homework noted in the syllabus lesson plan and/or given by the course director.
- 6. Complete and know the learning objectives for each chapter.
- 7. View any videos applicable to dated lesson plan material.
- 8. Obtain materials from the course Materials Drive: M/Dental Hygiene/DHYG 1000. Prior to class, print any materials available to be used in this class for study and during lecture and/or lab.
- 9. Students are advised to check their e-mails regularly for any additional information that is related to the class or the Dental Hygiene Program.

#### **ATTENDANCE GUIDELINES**

Class attendance is a very important aspect of a student's success. Being absent from class prevents students from receiving the full benefit of a course and also interrupts the learning process. Southeastern Technical College considers both tardiness and leaving early as types of absenteeism. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is required for student success. Students will be expected to complete all work required by the instructor as described in the individual course syllabus. Students who stop attending class, but do not formally withdraw, may receive a grade of "F" (Failing 0-59) and face financial aid repercussions in upcoming semesters. Instructors are responsible for determining whether missed work may be made up and the content and dates for makeup work is at the discretion of the instructor. Excused absences will be evaluated on a case-by-case basis by the program director. Examples of excused absences would be a car accident on the way to class or unexpected hospitalization of the student. Please do not plan a vacation or schedule a routine medical/dental appointment during the designated class times. Unexcused absences will not be made up and may lead to the student's failure of the course. Program director must be notified of any absences prior to scheduled class session.

Attendance is counted from the first scheduled class meeting of each semester. To receive credit for a course, a student must attend at least 90% of the scheduled instructional time. Assignments missed due to tardiness

or absences must be made up at the convenience of the instructor. Any student attending less than the required scheduled instructional time (90%) may be dropped from the course as stated below in the Withdrawal Procedure. Tardy means arriving after the scheduled time for instruction to begin. Early departure means leaving before the end of the scheduled time. Three (3) tardies or early departures equal one (1) absence for the course. For this class, which meets one session per week for 15 weeks, the maximum number of sessions a student may miss for attendance purposes is two sessions during the semester.

#### ADDITIONAL ATTENDANCE GUIDELINES FOR HEALTH SCIENCES

Requirements for instructional hours within Health Science programs reflect the rules of respective licensure boards and/or accrediting agencies. Therefore, these programs have stringent attendance policies. Each program's attendance policy is published in the program's handbook and/or syllabus which specify the number of allowable absences. All provisions for required makeup work in the classroom or clinical experiences are at the discretion of the instructor.

#### **SPECIAL NEEDS**

Students with disabilities who believe that they may need accommodations in this class based on the impact of a disability are encouraged to contact <u>Helen Thomas</u> (<u>hthomas@southeasterntech.edu</u>), 912-538-3126, to coordinate reasonable accommodations.

#### **SPECIFIC ABSENCES**

Provisions for Instructional Time missed because of documented absences due to jury duty, military duty, court duty, or required job training will be made at the discretion of the instructor.

#### **PREGNANCY**

Southeastern Technical College does not discriminate on the basis of pregnancy. However, we can offer accommodations to students who are pregnant that need special consideration to successfully complete the course. If you think you will need accommodations due to pregnancy, please advise me and make appropriate arrangements with <a href="https://example.com/helen\_homas">helen\_homas</a> (<a href="https://example.com/homas@southeasterntech.edu">https://example.com/homas@southeasterntech.edu</a>), 912-538-3126.

#### WITHDRAWAL PROCEDURE

Students wishing to officially withdraw from a course(s) or all courses after the drop/add period and prior to the 65% point of the term in which student is enrolled (date will be posted on the school calendar) must speak with a Career Counselor in Student Affairs and complete a Student Withdrawal Form. A grade of "W" is assigned for the course(s) when the student completes the withdrawal form.

Students who are dropped from courses due to attendance after drop/add until the 65% point of the semester will receive a "W" for the course.

Important – Student-initiated withdrawals are not allowed after the 65% point. Only instructors can drop students after the 65% point for violating the attendance procedure of the course. Students who are dropped from courses due to attendance after the 65% point will receive either a "WP" or "WF" for the semester. Informing your instructor that you will not return to his/her course, does not satisfy the approved withdrawal procedure outlined above.

There is no refund for partial reduction of hours. Withdrawals may affect students' eligibility for financial aid for the current semester and in the future, so a student must also speak with a representative of the Financial Aid Office to determine any financial penalties that may be accessed due to the withdrawal. A grade of 'W' will count in attempted hour calculations for the purpose of Financial Aid.

**Remember** - Informing your instructor that you will not return to his/her course does not satisfy the approved withdrawal procedure outlined above.

#### **MAKEUP GUIDELINES**

Students are allowed to make up only one missed exam excluding the final examination. This is only if they have an excused absence approved by the instructor. The makeup exam may be given in a different format than the original exam. A doctor's excuse and/or additional documentation will be requested. Ten points will be deducted from the test for taking the test late. All other missed exams/quizzes/class preparation assessments will result in a grade of zero "0". If you enter the classroom late, you will not be allowed to take the exam, and you will be issued a grade of zero "0" for the exam. PLEASE be on time! Projects are due on the date specified on the lesson plan at the start time of the class. Projects will not be accepted late for any reason!

Failure to complete homework assignments will result in one point being deducted from the final course grade for each assignment not completed by the deadline specified. Late or incomplete assignments will still need to be completed and turned in for instructor review and feedback. If you are going to be absent, you should deliver your assignment to your instructor prior to the deadline to ensure credit.

#### **ACADEMIC DISHONESTY POLICY**

The Southeastern Technical College Academic Dishonesty Policy states that all forms of academic dishonesty, including but not limited to cheating on tests, plagiarism, collusion, and falsification of information, will call for discipline. The policy can also be found in the Southeastern Technical College Catalog and Handbook.

#### PROCEDURE FOR ACADEMIC MISCONDUCT

The procedure for dealing with academic misconduct and dishonesty is as follows:

#### 1. First Offense

Student will be assigned a grade of "0" for the test or assignment. Instructor keeps a record in course/program files and notes as first offense. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus. The Registrar will input the incident into Banner for tracking purposes.

#### 2. Second Offense

Student is given a grade of "WF" (Withdrawn Failing) for the course in which offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of second offense. The Registrar will input the incident into Banner for tracking purposes.

#### 3. Third Offense

Student is given a grade of "WF" for the course in which the offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of third offense. The Vice President for Student Affairs, or designee, will notify the student of suspension from college for a specified period of time. The Registrar will input the incident into Banner for tracking purposes.

#### STATEMENT OF NON-DISCRIMINATION

The Technical College System of Georgia and its constituent Technical Colleges do not discriminate on the basis of race, color, creed, national or ethnic origin, sex, religion, disability, age, political affiliation or belief, genetic information, disabled veteran, veteran of the Vietnam Era, spouse of military member or citizenship status (except in those special circumstances permitted or mandated by law). This school is in compliance with Title VI of the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, or national origin; with the provisions of Title IX of the Educational Amendments of 1972, which prohibits discrimination on the basis of gender; with the provisions of Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination on the basis of handicap; and with the American with Disabilities Act (ADA).

The following individuals have been designated to handle inquiries regarding the nondiscrimination policies:

American With Disabilities Act (ADA)/Section 504 - Equity- Title IX (Students) - Office of Civil Rights (OCR) Compliance Officer	Title VI - Title IX (Employees) – Equal Employment Opportunity Commission (EEOC) Officer
Helen Thomas, Special Needs Specialist	Lanie Jonas, Director of Human Resources
Vidalia Campus	Vidalia Campus
3001 East 1 <sup>st</sup> Street, Vidalia	3001 East 1 <sup>st</sup> Street, Vidalia
Office 108 Phone: 912-538-3126	Office 138B Phone: 912-538-3230
Email: Helen Thomas	Email: <u>Lanie Jonas</u>
hthomas@southeasterntech.edu	ljonas@southeasterntech.edu

#### **ACCESSIBILITY STATEMENT**

Southeastern Technical College is committed to making course content accessible to individuals to comply with the requirements of Section 508 of the Rehabilitation Act of Americans with Disabilities Act (ADA). If you find a problem that prevents access, please contact the course instructor.

#### **GRIEVANCE PROCEDURES**

Grievance procedures can be found in the Catalog and Handbook located on Southeastern Technical College's website.

#### **ACCESS TO TECHNOLOGY**

Students can now access Blackboard, Remote Lab Access, Student Email, Library Databases (Galileo), and BannerWeb via the mySTC portal or by clicking the Current Students link on the <u>Southeastern Technical College</u> (<u>www.southeasterntech.edu</u>).

#### TECHNICAL COLLEGE SYSTEM OF GEORGIA (TCSG) GUARANTEE/WARRANTY STATEMENT

The Technical College System of Georgia guarantees employers that graduates of State Technical Colleges shall possess skills and knowledge as prescribed by State Curriculum Standards. Should any graduate employee within two years of graduation be deemed lacking in said skills, that student shall be retrained in any State Technical College at no charge for instructional costs to either the student or the employer.

#### **INSTRUCTIONAL DELIVERY METHODS**

The following methods will be utilized to facilitate learning in lecture sessions. Sessions may employ PowerPoint presentations with handouts, workbook activity sheets, homework assignments, multimedia presentations, group discussions, independent reading assignments, research activities, interactive websites,

games, and group collaboration.

#### **EVALUATION PROCEDURES**

#### **EXAMS**

Students will be given a total of four lecture exams. The four lecture exams include three examinations throughout the semester and one comprehensive final exam at the end of the semester. No make-up exam will be allowed for the final examination. A total of 100 points may be earned on each lecture exam. Students will be given four written examinations covering the following material from the course textbook:

Exam 1: Chapters 1 and 2

Exam 2: Chapters 15, 16, and 17

Exam 3: Chapters 18, 19, and 20

Exam 4: Comprehensive Final Exam containing a final comprehensive lab component

#### **LAB SKILLS EXAMS**

Students will be given a total of four lab skills exams. The lab skills exams will be throughout the semester. A total of 100 points may be earned on each lab skills exam.

The lab skills exams will cover the following material from the course textbook:

Lab Skill Exam 1: Facial and Oral Anatomy Landmarks Recognition.

Lab Skill Exam 2: Tooth identification/classification of Maxillary and Mandibular Permanent Incisors and Canines using extracted teeth.

Lab Skill Exam 3: Tooth identification/classification of Maxillary and Mandibular Permanent Premolars and Molars using extracted teeth.

Lab Skill Exam 4: Using anatomical findings, recognize/distinguish differences in Maxillary and Mandibular Primary teeth and Malocclusion identification.

Each lab skills exam requires a minimum grade of 80% on the initial exam attempt or the student must remediate and take a second exam which may differ from the original exam. The initial/first graded score is the grade that is recorded and used in the final grade computation, not the graded score of the second attempt. The student will have a maximum of two attempts to score a grade of 80% or higher on each lab skills exam. If the student cannot attain the grade of 80% benchmark on the second and final attempt, the student will be dropped from the course and receive a grade of "F". A grade of "F" will result in the student not being able to progress in the dental hygiene program per program policy.

The students will be required to identify tooth anatomy and root morphology at designated stations in the laboratory utilizing study models, extracted teeth, etc. Students may be asked to engage in team dental debates on what constitutes their support for a tooth identification justification. Students will be encouraged to use the knowledge gained in the lecture sessions to make critical thinking assessments in the lab experiences.

Laboratory assignments, workbook assignments, assignments on tooth drawings, tooth labeling exercises, and student study worksheets may be assigned throughout the semester. The assignments, which correspond with the lecture chapters, will not receive a numerical grade. They are intended to give students additional practice in tooth anatomy and root morphology. The instructor will verify that each assignment is completed as well as give feedback. **Each assignment that is not completed in the specified time frame will result in a** 

one point deduction from the final course grade. The work will be checked on each exam day and is directly related to the material covered on the exam on that day. Incomplete assignments will still need to be completed and turned in for instructor review and feedback. (Example: Exam on Chapters 1 and 2: the assignments checked will be on chapters 1 and 2 from the workbook, all assignments, and any worksheets, charts or assigned materials related to the chapters being studied as designated on the lesson plan located in this syllabus.)

#### **HOMEWORK**

Workbook assignments and handout completions for homework are noted in the course lesson plan and may also be assigned throughout the semester. They are intended to give each student additional understanding of tooth anatomy and root morphology. The instructor will verify that each assignment is completed, as well as give feedback. The work will be checked on each test day and is directly related to the material covered on the test on that day. (Example: Exam on chapters 1 & 2: the assignments checked and graded will be on chapters 1 & 2 from the workbook and any other worksheets, charts or assigned materials related to the chapters being studied.) A deduction of one point per each incomplete or late assignment will be calculated in the final course grade component. Late assignments are still required to be turned in for instructor review and/or feedback.

#### **CLASS PREPARATION ASSESSMENT**

A class preparation assessment and grade will be given at the beginning of class sessions as noted in the lesson plan. Each student shall randomly draw one question. The question will cover some topic or portion of the course material the student should have read and studied as noted in the syllabus lesson plan. If a student demonstrates prior class preparation by answering the question correctly, a session grade of one hundred (100) shall be recorded. If a student fails to demonstrate prior class preparation by answering the question incorrectly, a session grade of zero (0) will be recorded. The student will be allowed to remain in class, but shall be required to report to campus on Thursdays from 9:00am -11:00am and study the course material to ensure time has been spent studying, and that application and understanding of course material may be achieved.

#### **GRADING POLICY**

Assessment/Assignment	Percentage
Examination 1	10%
Examination 2	10%
Examination 3	10%
Examination 4 (Final)	15%
Lab Skills Exam 1	10%
Lab Skills Exam 2	10%
Lab Skills Exam 3	10%
Lab Skills Exam 4	10%
Class Preparation Assessments 1-6 (6 averaged together)	15%

#### **CALCULATION OF FINAL COURSE GRADE**

Evaluation Item	Grade	(X) %	Points
Examination 1		0.10	
Examination 2		0.10	
Examination 3		0.10	
Examination 4 (Final)		0.15	
Lab Skills Exam 1		0.10	
Lab Skills Exam 2		0.10	
Lab Skills Exam 3		0.10	
Lab Skills Exam 4		0.10	
Class Preparation Assessment 1			
Class Preparation Assessment 2			
Class Preparation Assessment 3			
Class Preparation Assessment 4			
Class Preparation Assessment 5			
Class Preparation Assessment 6			
Class Preparation Assessments 1-6		0.15	
(6 averaged together)			
-Point Deductions for late/incomplete assignments			
Subtotal			
Final Course Grade			

#### **GRADING SCALE**

Letter Grade	Range
Α	90-100
В	80-89
С	70-79
D	60-69
F	0-59

#### **DENTAL HYGIENE PROGRAM GOALS**

- A. To provide comprehensive preparation of competent individuals in the arts and sciences pertinent to the discipline of dental hygiene.
- B. To provide comprehensive preparation of competent individuals in the clinical and laboratory experiences, which are necessary to develop skills in rendering professional dental hygiene patient care to the public.
- C. To provide an environment which will foster respect for the Dental Hygiene Professional Code of Ethics and Conduct and assure recognition and acceptance of the responsibilities of the profession of dental hygiene.
- D. To prepare the graduates of the basic two-year curriculum in dental hygiene to fulfill the dental hygienist's role in community oral health services.
- E. To teach students to conduct critical reviews of current literature as a means of research and life-long learning.

F. To teach students to seek life-long learning through continuing education courses on the latest products and developments in dentistry and medicine.

#### **DHYG 1000 TOOTH ANATOMY AND ROOT MORPHOLOGY LEARNING OBJECTIVES**

After studying the chapter, the student should be able to:

#### **Chapter 1: Face and Neck Regions**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Locate and identify the regions and associated surface landmarks of the face on a diagram and a patient. (A,B,D)
- 3. Integrate the clinical considerations for the surface anatomy of the face into patient examination and care. (A,B,D)
- 4. Locate and identify the regions and associated surface landmarks of the neck on a diagram and a patient. (A,B,D)
- 5. Integrate the study of surface anatomy of the neck into patient examination and care. (A,B,D)

#### **Chapter 2: Oral Cavity and Pharynx**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Locate and identify the divisions and associated surface landmarks of the oral cavity on a diagram and a patient. (A,B,D)
- 3. Integrate the clinical considerations for the surface anatomy of the oral cavity into patient examination and care. (A,B,D)
- 4. Outline the divisions of the pharynx and identify them on a diagram. (A,B,D)
- 5. Integrate the study of surface anatomy of the visible divisions of the pharynx into patient examination and care. (A,B,D)

#### **Chapter 15: Overview of Dentitions**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Describe the two dentitions and the relationship to each other. (A,B,D)
- 3. Recognize tooth types and outline the tooth numbering systems. (A,B,D)
- 4. Assign the correct universal or international number for a tooth and its correct dentition period on a diagram or a skull and for a tooth model or a patient. (A,B,D)
- 5. Define each dentition period and discuss the clinical considerations concerning each dentition period, integrating it into patient care. (A,B,D)
- 6. Use the correct dental anatomy terminology and discuss the clinical considerations concerning tooth anatomy, integrating it into patient care. (A,B,D)
- 7. Use the correct orientational tooth terms and discuss the clinical considerations concerning tooth surfaces, integrating it into patient care. (A,B,D)
- 8. Identify tooth forms and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)

#### **Chapter 16: Permanent Anterior Teeth**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Identify the permanent anterior teeth and discuss their properties and the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 3. Identify the permanent incisors and their general features and discuss their clinical considerations, integrating it into patient care. (A,B,D)

- 4. Describe the general and specific features of the permanent maxillary incisors and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 5. Describe the general and specific features of the permanent mandibular incisors and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 6. Identify the permanent canines and their general features and discuss their clinical considerations, integrating it into patient care. (A,B,D)
- 7. Describe the general and specific features of the permanent maxillary canines and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 8. Describe the general and specific features of the permanent mandibular canines and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 9. Assign the correct names and universal or international tooth number for each permanent anterior tooth on a diagram or a skull and for a tooth model or a patient. (A,B,D)
- 10. Demonstrate the correct location of each permanent anterior tooth on a diagram, a skull, and a patient. (A,B,D)

#### **Chapter 17: Permanent Posterior Teeth**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Identify the permanent posterior teeth and discuss their properties and the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 3. Identify the permanent premolars and their general features and discuss their clinical considerations, integrating it into patient care. (A,B,D)
- 4. Describe the general and specific features of the permanent maxillary premolars and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 5. Describe the general and specific features of the permanent mandibular premolars and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 6. Identify the permanent molars and their general features and discuss their clinical considerations, integrating it into patient care. (A,B,D)
- 7. Describe the general and specific features of the permanent maxillary molars and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 8. Describe the general and specific features of the permanent mandibular molars and discuss the clinical considerations concerning them, integrating it into patient care. (A,B,D)
- 9. Assign the correct names and universal or international tooth number for each permanent posterior tooth on a diagram or a skull and for a tooth model or a patient. (A,B,D)
- 10. Demonstrate the correct location of each permanent posterior tooth on a diagram, a skull, and a patient. (A,B,D)

# **Chapter 18: Primary Dentition**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Discuss primary teeth properties and the clinical considerations for primary dentition, integrating it into patient care. (A,B,D)
- 3. Describe the general features of primary teeth and each primary tooth type as well as the specific features of each primary tooth. (A,B,D)
- 4. Discuss the clinical considerations concerning primary molars, integrating it into patient care. (A,B,D)
- 5. Assign the correct name and universal number for each primary tooth on a diagram and a patient. (A,B,D)
- 6. Demonstrate the correct location of each primary tooth on a diagram and on a patient. (A,B,D)

#### **Chapter 19: Temporomandibular Joint**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Describe the histology of each component of the temporomandibular joint and how it relates to its clinical features. (A,B,D)
- 3. Outline the movements of the temporomandibular joint as well as demonstrating them on a skull, a dentition model, and a patient. (A,B,D)
- 4. Discuss the clinical considerations for joint pathology and temporomandibular joint disorders, integrating it into patient care. (A,B,D)
- 5. Locate and identify the specific anatomic landmarks of the temporomandibular joint on a diagram, a skull, and a patient. (A,B,D)

#### **Chapter 20: Occlusion**

- 1. Define and pronounce the key terms in this chapter. (A,B,D)
- 2. Discuss occlusion and centric occlusion and its relationship to functional movements and patterns of the mandible. (A,B,D)
- 3. Discuss arch form and the phases of arch development. (A,B,D)
- 4. Describe dental curvatures and angulations. (A,B,D)
- 5. Discuss centric relation, lateral and protrusive occlusions, and the mandibular rest position and how to achieve each of them on a skull, a dentition model, and a patient. (A,B,D)
- 6. Demonstrate the movements of the mandible related to occlusion. (A,B,D)
- 7. Discuss primary occlusion and the clinical considerations concerning it, integrating it into patient care. (A,B,D)
- 8. Identify the key concepts of occlusion on a diagram, a dentition model, and a patient. (A,B,D)
- 9. Discuss malocclusion and outline Angle classification and how it relates to patient care, including clinical considerations concerning parafunctional habits. (A,B,D)
- 10. Identify on dentition models each division of Angle classification of malocclusion. (A,B,D)
- 11. Demonstrate an initial occlusal evaluation on a patient and record findings. (A,B,D)

# DHYG 1000 Tooth Anatomy and Root Morphology Fall Semester 2018 Lesson Plan

WeekLessonDates8/14Chapter Week 1First day of class/Introduction to Course—Syllabi, Outline, Rules, Regulations Coverage.Read Chapter 1 Complete Assignments: Workbook: Pages 1-7; Glossary Exercises: UNIT 1: Pages 82-83 UNIT I Review Exercises: Pages 201-204Italicized Texts and Chapters in lesson plan are for reference material onlyClinic Patient Chart Forms: Distribution of form packets; discuss relevance of patient chart forms to patient care and tooth anatomy.Wey Terms DefinitionsDemonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive APPSReview Clinic Manual section on assessmentFace and Neck Regions LAB Oral Anatomy Landmarks Worksheets and ExercisesOn M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.Identify facial and oral landmarks on study models and complete worksheetsRefer to charts in back of textbook Skeletal Bone Locations on classroom models	Area CC 1,2,3,4,5 GC c
Week 1  Italicized Italicized Texts and Chapters in lesson plan are for reference material only  Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Complete Assignments: Workbook: Pages 1-7; Glossary Exercises: UNIT 1: Pages 82-83 UNIT I Review Exercises: Pages 201-204  Key Terms Definitions Vocabulary Terms provided by instructor  Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Regulations Coverage.  Workbook: Pages 1-7; Glossary Exercises: UNIT 1: Pages 82-83 UNIT I Review Exercises: Pages 201-204  Key Terms Definitions Vocabulary Terms provided by instructor  Review Clinic Manual section on assessment  Review Clinic Manual section on assessment	
Regulations Coverage. Chapter 1 Face and Neck Regions PowerPoint (PPT) Discussion  Clinic Patient Chart Forms: Distribution of form packets; discuss relevance of patient chart forms to patient care and tooth anatomy.  Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Regulations Coverage. Workbook: Pages 1-7; Glossary Exercises: UNIT 1: Pages 82-83 UNIT I Review Exercises: Pages 201-204  Key Terms Definitions Vocabulary Terms provided by instructor  Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	GC c
Italicized Texts and Chapters in lesson plan are for reference material only  Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive APPS Face and Neck Regions LAB Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Workbook: Pages 1-7; Glossary Exercises: UNIT 1: Pages 82-83 UNIT I Review Exercises: Pages 201-204  Key Terms Definitions Vocabulary Terms provided by instructor  Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
Texts and Chapters in lesson plan are for reference material only  Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive APPS  Face and Neck Regions PowerPoint (PPT) Discussion  Demonstration of the following APPS and Websites: Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Texts and Chapters  Pages 82-83  UNIT I Review Exercises: Pages 201-204  Key Terms Definitions  Vocabulary Terms provided by instructor  Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
Chapters in lesson plan are for reference material only  Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Interson plan are for plant (PPT) Discussion  Clinic Patient Chart Forms: Distribution of form packets; discuss relevance of patient chart forms to patient care and tooth anatomy.  Vocabulary Terms provided by instructor  Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
in lesson plan are for reference material only  Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive APPS Face and Neck Regions LAB Oral Anatomy Landmarks Worksheets and Exercises:  Identify facial and oral landmarks on study models and complete worksheets  Inlesson plan are for Distribution of form packets; discuss relevance of patient chart forms to patient care and tooth anatomy.  Key Terms Definitions Vocabulary Terms provided by instructor  Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
Clinic Patient Chart Forms:     Distribution of form packets; discuss relevance of patient chart forms to patient care and tooth anatomy.  Demonstration of the following APPS and Websites:     Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Oral Shatomy Locations on classroom models  Clinic Patient Chart Forms:  Reylew Clinic Manual section on assessment  On M:DRIVE:  Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Distribution of form packets; discuss relevance of patient chart forms to patient care and tooth anatomy.  Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Oistribution of form packets; discuss relevance of patient chart forms to yocabulary Terms provided by instructor  Review Clinic Manual section on assessment  On M:DRIVE:  Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
reference material only  Pemonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive APPS  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Premonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  We instructor  Review Clinic Manual section on assessment  On M:DRIVE:  Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Demonstration of the following APPS and Websites: Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Websites: Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
and Websites: Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Websites: Review Clinic Manual section on assessment  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
Interactive Face & Neck Tutorials Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Worksheets  Review Clinic Manual section on assessment  On M:DRIVE:  Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Interactive Skeletal Tutorials Interactive APPS  Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Worksheets  Section on assessment  On M:DRIVE:  Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Interactive APPS Face and Neck Regions LAB Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Worksheets  On M:DRIVE: Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
Face and Neck Regions LAB  Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Worksheets  On Midentify:  Print out all corresponding handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Worksheets  Keglons LAB  handouts or worksheets relevant to class sessions and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Oral Anatomy Landmarks Worksheets and Exercises  Identify facial and oral landmarks on study models and complete worksheets  Worksheets  Kefer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Identify facial and oral landmarks on study models and complete worksheets  Worksheets  Oral Anatomy Landmarks worksheets and bring to class.  Refer to charts in back of textbook  Skeletal Bone Locations on classroom models	
Identify facial and oral landmarks on study models and complete worksheets  Refer to charts in back of textbook Skeletal Bone Locations on classroom models	
study models and complete textbook worksheets Skeletal Bone Locations on classroom models	
study models and complete textbook worksheets Skeletal Bone Locations on classroom models	
worksheets Skeletal Bone Locations on classroom models	
classroom models	
Partner quiz activity of anatomical	
structures Get Body Smart Skeletal	
System	
The Winking Skull	
APPS for Study and Review:	
Bone Box ISO FORM Dental	
3 D Skull Atlas	

Date/ Week	Chapter/ Lesson	Content	Assignments & Tests Due Dates	Competency Area
8/21	Chapter	Chapter 2	Class Preparation	CC 1,2
Week 2 2	Oral Cavity and Pharynx	Assessment #1	GC a,c	
		PPT Discussion	Read Chapter 2	
		LAB	Workbook: Pages 5-7	
		Identify facial & oral landmarks on study models	_	
			Review Clinic Manual	
		Complete Lab Exercises and Worksheets in Class	section on assessment	
8/28	Chapter	Chapter 15 (post exam #1)	EXAM #1 Chapters 1-2	CC 2,3,4,5
Week 3	15	Overview of Dentitions	Vocabulary Terms	GC a,c
		PPT Discussion		,-
	Wilkins		Place Homework	
	Text:	Three Tooth Numbering	assignments on the desk in	
	Chapter	Systems/Explanations/Worksheets	the back of the classroom	
	16	Systems, Explanations, Welliameter	for instructor to review.	
		Clinic Paper Dental Chart and		
		Computer-Generated Software	Read Chapters 15, 16, 17	
		Systems	Workbook UNIT IV:	
			Pages 44-61	
		Introduce Eaglesoft Dental	Glossary Exercises: Pages	
		Software/Show Eaglesoft Dental	94-97	
		Software Program and Dental Chart	UNIT IV Case Studies: 1-4	
			Pages 239-246	
		Students will complete numbering	UNIT IV Review Exercises:	
		worksheets and exercises to compare the different tooth numbering	Pages 213-217	
		systems used.	Review Clinic Manual	
		Comparisons with written charting	section on assessment	
		and computer charting systems.	and EagleSoft	
		LAB	Permanent dentition	
		Review for Lab Skills Test 1	Universal Numbering	
			System flash cards	
			Permanent dentition FDI	
			ISO Numbering System	
			flash cards	

Date/ Week	Chapter/ Lesson	Content	Assignments & Tests Due Dates	Competency Area
9/4	Chapter	Chapter 16 (post lab skills exam #1)	Lab Skills Exam #1	CC 2,3,4,5,7
Week 4	16	Permanent Anterior Teeth PPT Discussion	Anatomical Landmarks	GC a,c
	Wilkins Text: Chapter 16	Tooth Dentition Scale ID Activities and Identification Worksheets	Permanent Anterior Teeth Flashcards	
9/11 Week 5	Chapter 16	Permanent Anterior Teeth LAB	Class Preparation Assessment #2	CC 1,2,5 GC a,c
	Wilkins Text: Chapter 16	Maxillary & Mandibular Incisors/Canines Tooth Identification Lab post receiving identification tips/hints from instructor  Peer/Group Practice and Identification of Teeth using dentition scale, model teeth, and autoclaved natural teeth	Read Chapter assignments *Bring your Dentition Scale and Study Models to Classroom for use Workbook: Pages 111-147  Maxillary and Mandibular Incisor Characteristics	
		Partner quiz activity on extracted and dentition scale teeth  Identification Worksheets	Flashcards	
9/18 Week 6	Chapter 17 Wilkins Text: Chapter 17	Chapter 17 Permanent Posterior Teeth PPT Discussion (post lab work below) LAB Maxillary and Mandibular Incisors/Canines	Class Preparation Assessment #3  Read Chapter 17  Workbook: Pages 148-195  Permanent Maxillary Premolars Flashcards	CC 2,3,4,5,7 GC c
		Review for Lab Skill Exam 2.  Models, Dentition Scale, and autoclaved teeth and Worksheets will be used.  Partner quiz activity on extracted and dentition scale teeth.	Permanent Mandibular Premolars Flashcards Permanent Premolars Flashcards	

Date/ Week	Chapter/ Lesson	Content	Assignments & Tests Due Dates	Competency Area
9/25	Chapter	Chapter 17 Permanent Posterior	Lab Skills Exam # 2	CC 2,3,4,5,7
Week 7	17	Teeth	Maxillary and Mandibular	GC c
		PPT Discussion (post lab skills exam	Incisors and Canines	
	Wilkins	#2)	Tooth ID	
	Text:		Read Chapter assignments	
	Chapter		Permanent Maxillary First	
	17		Molar Flashcards	
			Permanent Maxillary	
			Molars Flashcards	
10/02	Chapter	LAB	Class Preparation	CC 2,3,4,5
Week 8	17	Permanent Posterior Teeth	Assessment #4	GC a,c
	Wilkins Text: Chapter	Continue to view premolars and molars.	Place Homework assignments on the desk in the back of the classroom for instructor to review.	
	17	Study differences on extracted teeth, dentition scale, and model examples.	Tor instructor to review.	
		Partner quiz on extracted and dentition scale teeth.	Complete Tooth Numbering Assignment and Bring to Next Session	
	Learn anatomical findings on teeth.	Next Session		
		Tooth transparencies used for anatomical referencing.	Maxillary Second Permanent Molars	
	Identification Activity.	Identification Activity.	Flashcards	
		Students will examine extracted		
		teeth, model teeth, and make	Permanent Mandibular	
		notations of their findings on	Molars Flashcards	
		worksheets.		

Date/ Week	Chapter/ Lesson	Content	Assignments & Tests Due Dates	Competency Area
10/09	Chapter	Chapter 18 (post exam #2)	Read Chapter 18	CC 2,3,4,5
Week 9	18	Primary Dentition	Exam #2	GC a,c
		PPT Discussion	Chapters 15-17	,
	Wilkins			
	Text:	Primary Decay	Dentition of Primary Teeth	
	Chapter 16	PPT Discussion	Flashcards	
		LAB	Primary Dentition Flashcards	
		Review for Lab Skills Test #3 Premolars and Molars	Trasficaras	
		Students will review extracted teeth, dentition scale and model examples		
		Partner quiz on extracted and dentition scale teeth		
		Review and Complete Worksheets		
10/16	Chapter	Chapter 19 (post lab skills exam # 3)	Lab Skills Exam #3	CC 1,2,6
Week 10	19	Temporomandibular Joint	Maxillary and Mandibular	GC a,c
		PPT Discussion	Premolars and Molars	
		Demonstrate functions of TMJ using	Tooth ID	
		models. Show TMD issues which	Read Chapter 19	
		patients may experience.	WORKBOOK: Pages 61-62	
			Temporomandibular Joint Flashcards	
			TMJ Flashcards	
10/23	Chapter	Chapter 20	Class Preparation	CC 1-7
Week 11	20	Occlusion	Assessment #5	GC c
		PPT Discussion	Read Chapter 20	
	Wilkins		WORKBOOK: Pages 67-70	
Text: Chapter		Interactive LAB	Occlusion Flashcards	
	17	Primary Dentition: Identification		
	1	Worksheets, exercises, dentition	Primary Occlusion Flashcards	
		models of primary and mixed dentitions, and extracted teeth used	FidSilCalus	
		for identification purposes.	Review Clinic Manual	
		Activity: Clinical ID of Occlusion using	section on assessment	
		workbook, periodontal probe, floss,		
		articulating paper, study models.		

Date/	Chapter/	Content	Assignments & Tests Due	Competency
Week	Lesson		Dates	Area
10/30	Chapter	Chapter 20 Occlusion	Class Preparation	CC 1,2,6
Week 12	20	PPT Discussion Continued	Assessment #6	GC a,c
	Wilkins Text: Chapter 17	LAB Utilize models and pictures to learn various occlusions and malocclusions. Complete Worksheets and Charts	Read Chapter assignments and review Clinic Manual section on assessment	
11/06	Chapters	Interactive LAB (post exam #3)	Exam #3 Chapters 18-20	CC 1-7
Week 13	18,19,20 Wilkins Text: Chapters 16, 17	Review Primary Dentition: Identification and Malocclusion. Complete any worksheets. Models and pictures used to identify various Occlusion Classifications. Occlusion ID and documentation on clinic chart form activity. Extracted teeth and model teeth used for identification purposes.	Place Homework assignments on the desk in the back of the classroom for instructor to review.  Read Chapter assignments and review Clinic Manual section on assessment	GC a,c
11/13 Week 14	Chapters 18,19,20	Review of all material covered and the relevance and application of material in clinical patient care and using clinic forms.	Bring Clinic Manual, EIO, Dental Charting, and Occlusion Clinic Forms to class today.	CC 1-7 GC a,c
11/20	Chapters	Final Exam Review (post lab exam #4)	Lab Skills Exam #4	CC 1-7
Week 15	1, 2, 15- 20		Primary Dentition Identification and Malocclusion	GC a,c
12/03 Monday 8am Final	Chapters 1, 2, 15- 20 and all Lab Skills	Chapters 1, 2, 15-20	Comprehensive Final Exam #4	CC 1-7 GC a,c

<sup>\*</sup>This lesson plan is subject to change at the discretion of the instructor.

# Competency Areas (CC):

- 1. Oral Cavity Anatomy
- 2. Dental Terminology
- 3. External and Internal Tooth Anatomy
- 4. Tooth Nomenclature and Numbering Systems
- 5. Individual Tooth and Root Morphology
- 6. Occlusion
- 7. Dental Anomalies

# **General Core Educational Competencies (GC):**

- a) The ability to utilize standard written English.
- b) The ability to solve practical mathematical problems.
- c) The ability to read, analyze, and interpret information.