# LECTURE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st week</td>
<td>Review Syllabi and Lab Manual</td>
</tr>
<tr>
<td>2nd week</td>
<td><strong>CH 1</strong> Introduction</td>
</tr>
<tr>
<td>3rd week</td>
<td><strong>CH 2</strong> Materials Science and Dentistry</td>
</tr>
<tr>
<td>4th week</td>
<td><strong>CH 3</strong> Physical and Mechanical Properties of Dental Materials</td>
</tr>
<tr>
<td>5th week</td>
<td><strong>Test #1</strong> <em>(Chapters 1, 2, 3)</em> Amalgam and Direct Gold</td>
</tr>
<tr>
<td>6th week</td>
<td><strong>CH 4</strong> Adhesive Materials <strong>CH 5</strong> Direct Polymeric Restorative Materials Dental Cements</td>
</tr>
<tr>
<td>7th week</td>
<td><strong>CH 6</strong> Amalgam and Direct Gold Elastomeric Impression (cont’d)</td>
</tr>
<tr>
<td>8th week</td>
<td><strong>Test #2</strong> <em>(Chapters 4, 5, 6)</em></td>
</tr>
<tr>
<td>9th week</td>
<td>Spring Break</td>
</tr>
<tr>
<td>10th week</td>
<td><strong>CH 7</strong> Dental Cements</td>
</tr>
<tr>
<td>11th week</td>
<td><strong>CH 8</strong> Impression Materials <strong>CH 9</strong> Gypsum Materials <strong>CH 10</strong> Materials for Fixed Indirect Restorations and Prostheses</td>
</tr>
<tr>
<td>12th week</td>
<td><strong>TEST #3</strong> <em>(Chapters 7, 8, 9, 10)</em></td>
</tr>
<tr>
<td>13th week</td>
<td><strong>CH 11</strong> Removable Prostheses and Acrylic Resins <strong>CH 12</strong> Specialty Materials</td>
</tr>
<tr>
<td>14th week</td>
<td><strong>CH 13</strong> Clinical Detection and Management of Dental Restorative Materials During Scaling and Polishing <strong>CH 14</strong> Instruments as Dental Materials <strong>CH 19</strong> Polishing Materials and Abrasion</td>
</tr>
<tr>
<td>15th week</td>
<td><strong>CH 15</strong></td>
</tr>
<tr>
<td>16th week</td>
<td><strong>TEST #4</strong> <em>(Chapters 11, 13, 14, 16, 19)</em></td>
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## LABORATORY SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st week</td>
<td>Introduction to Safety</td>
<td>Wilkins, 713-724</td>
</tr>
<tr>
<td></td>
<td>Desensitization</td>
<td></td>
</tr>
<tr>
<td>2nd week</td>
<td>Denture Cleaning</td>
<td>Wilkins, Pg 475-480</td>
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<tr>
<td></td>
<td>Topical Anesthetic</td>
<td>Wilkins, 604-607</td>
</tr>
<tr>
<td>3rd week</td>
<td>Periodontal Dressing - Bring Typodont</td>
<td>Wilkins, Pg 705-710</td>
</tr>
<tr>
<td>4th week</td>
<td>Amalgam Manipulation (demonstration)</td>
<td>Wilkins, Pg 742-750</td>
</tr>
<tr>
<td></td>
<td>Tofflemire Matrix &amp; Retainer (bring typodont)</td>
<td>Handout</td>
</tr>
<tr>
<td>5th week</td>
<td>Amalgam Polishing (demonstration)</td>
<td>Wilkins, Pg 747-751</td>
</tr>
<tr>
<td></td>
<td>Brush Biopsy</td>
<td>Handout</td>
</tr>
<tr>
<td>6th week</td>
<td><strong>Lab Practical #1</strong></td>
<td></td>
</tr>
<tr>
<td>7th week</td>
<td>Suture Removal</td>
<td>Wilkins, 699-705</td>
</tr>
<tr>
<td></td>
<td>Pulp Vitality Testing</td>
<td>Wilkins, 273-276 Handout</td>
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<tr>
<td>8th week</td>
<td>Mixing Alginate/Taking Impressions</td>
<td>Wilkins, 189-205 Handout</td>
</tr>
<tr>
<td></td>
<td>Model Trimming</td>
<td></td>
</tr>
<tr>
<td>9th week</td>
<td>Mixing Alginate/Taking Impressions - continued</td>
<td></td>
</tr>
<tr>
<td>10th week</td>
<td>Bleaching Tray Construction</td>
<td></td>
</tr>
<tr>
<td>11th week</td>
<td>Pit &amp; Fissure Sealants</td>
<td>Wilkins, 569-777</td>
</tr>
<tr>
<td>12th week</td>
<td>Pit &amp; Fissure Sealants (continued)</td>
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</tr>
<tr>
<td>13th week</td>
<td>Sealant Lab (in clinic)</td>
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<tr>
<td></td>
<td><strong>Lab Practical #2</strong></td>
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COURSE DESCRIPTION
DHYG 1219 is a study of the physical and chemical properties of dental materials including the application and manipulation of the various materials used in dentistry.

COURSE OBJECTIVES
At the completion of this course, the student will be able to demonstrate the following as evidenced by satisfactorily (75% or above) examination, quiz and assignment grades:
1. Relate the physical, chemical and mechanical characteristics of all dental materials studied.
2. Demonstrate proficiency in the manipulation techniques of dental materials.
3. Demonstrate knowledge of the correct terminology in dealing with dental materials.

CREDIT HOURS
Lecture 1 hour
Laboratory 3 hours
Course Credit 3 semester hours

PREREQUISITE: Admission to the Dental Hygiene Program

COURSE POLICIES

General Requirements
1. Preparation. During this course it is expected that the student prepare for class. This includes reading or viewing the information to be discussed the day prior to coming to class.

2. Assignments. All assignments and laboratory projects are to be turned in on the due date. All lecture assignments are to be completed on Blackboard. Late assignments will not be accepted. Assignments which are not turned in or incomplete will result in a grade of ‘0’ and could result in an incomplete grade in this course.

3. Attendance. In order to ensure the students in the dental hygiene program achieve the necessary didactic and laboratory competencies outlined in the curriculum, it is necessary that the student complete all assigned lecture classes and laboratory hours.

If you are unable to attend lecture class or lab, it is mandatory that you call the appropriate instructor prior to the scheduled class or lab time. The student is responsible for all material missed at the time of absence. Extenuating circumstances will be taken into account. Extenuating circumstances might include: funeral of immediate family member, maternity, hospitalization, etc.

It is expected that students will appear to take their exams at the regularly scheduled examination time. Make-up examinations will be given only if the absence is due to illness (confirmed by a physician’s excuse), a death in the immediate family, or at the discretion of the instructor.

Dental hygiene students will be allowed two absences in any lecture or lab. Absences must be accompanied by a written excuse on the next class day. In the event that a student misses class or lab beyond the allowed absences, the following policy will be enforced:
2 absences = verbal warning
3 absences = written warning with the Disciplinary Action Form (DAF)
4 absences = grade will be lowered one full letter grade
4. **Tardiness.** Tardiness is disruptive to the instructor and the students in the classroom. It is expected that students will arrive on time for class or lab, and remain until dismissed by the instructor. If tardiness becomes an issue, the following policy will be enforced:
   - Tardy 1 time = verbal warning
   - Tardy 2 times is considered an absence

5. **Electronic Equipment.** Electronic equipment such as telephones, pagers, and audio/video equipment are not allowed in the classroom. No text messaging during class.

6. **Examination and Quiz Policy.** Examinations will be based on objectives, lecture notes, handouts, assigned readings, audiovisual material and class discussions. The final examination will be comprehensive and consist of questions similar to those found on the major examinations.
   - Students are expected to complete examinations as scheduled. Make-up examinations will be given only if the absence is due to illness (verified by physicians excuse), a death in the immediate family, or at the discretion of the Instructor. All make-up examinations must be taken within two (2) weeks from the scheduled exam date. All examinations will be kept on file by the Instructor. Students may have access to the examination by appointment during the Instructor’s office hours. Exams may be reviewed up to two (2) weeks following the exam date.

**DISABILITIES STATEMENT**
The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities.

If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator, Jamie Fox, at 409-880-1737 or visit her office located in the Cecil Beeson Building, room 116B.

**REQUIRED TEXT**

**REFERENCE MATERIALS**


COURSE REQUIREMENTS

Lecture Requirements:
1. **Test Requirements.** The following information is a list of the lecture requirements. They may vary, depending upon the needs of the class as a whole.
   a. Tests
      1. 4 unit tests
2. **Class Assignments.** All class assignments will be completed on Blackboard. Late assignments will not be accepted. There will be a total of 10 assignments during the semester.
3. **Class Participation.** It is expected that every student will come to class prepared and ready to discuss reading assignment and outside assignments. A class participation rubric will be handed out in class.

Laboratory Requirements:
1. **Skill evaluations.** Successful completion of the following competency exams is necessary for completion of the course: Suture Removal, Topical Anesthetic Application, Desensitization of Hard Tissue, Vitality Testing, Periodontal Dressing (Placement & Removal). Competency must be met in order to meet the course requirements.
2. **Competency exams.** Successful completion of competency exams is required for course completion. The two competency exams are Pit and Fissure Sealants and Bleaching Tray Construction.
3. **Assignments.** Completion of laboratory exercises other than skill evaluations must be achieved and must meet the competency levels.
4. **Safety.** The appropriate safety principles and equipment must be utilized during laboratory sessions. The equipment may include gloves, safety glasses, face masks, and lab coats with name badges. Unless specified, this equipment must be worn during lab.

EVALUATION CRITERIA

<table>
<thead>
<tr>
<th>Lecture Grade Determination:</th>
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<tbody>
<tr>
<td>Test average</td>
<td>60%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Assignments</td>
<td>10%</td>
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<table>
<thead>
<tr>
<th>Laboratory Grade Determination:</th>
<th></th>
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<tbody>
<tr>
<td>Skill Evaluations</td>
<td>Completion</td>
</tr>
<tr>
<td>Pit and Fissure Sealants Competency Evaluation</td>
<td>Completion</td>
</tr>
<tr>
<td>Lab Practical Exams (2)</td>
<td>15%</td>
</tr>
<tr>
<td>Worksheets (3)</td>
<td>5%</td>
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</tbody>
</table>
GRADE SCALE
A  92-100
B  83-91
C  75-82
D  60-74
F  Below 60

COMPETENCY LEVELS
Lecture:
You must have a minimum grade of 75% to pass this course in order to progress in the Dental Hygiene program.

Laboratory:

<table>
<thead>
<tr>
<th>Skill Evaluations</th>
<th>Demonstrate laboratory competency</th>
</tr>
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<tbody>
<tr>
<td>Suture Removal</td>
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</tr>
<tr>
<td>Topical Anesthetic Application</td>
<td></td>
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<tr>
<td>Desensitization of Hard Tissue</td>
<td></td>
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<tr>
<td>Vitality Testing</td>
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</tr>
<tr>
<td>Periodontal Dressings Placement &amp; Removal</td>
<td>Demonstrate laboratory competency</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Worksheets</th>
<th>Worksheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Models</td>
<td></td>
</tr>
<tr>
<td>Periodontal Dressings Mixing</td>
<td></td>
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<table>
<thead>
<tr>
<th>Competency Exams</th>
<th>Demonstrate clinical competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pit &amp; Fissure Sealants</td>
<td></td>
</tr>
<tr>
<td>Bleaching Tray</td>
<td>Demonstrate laboratory competency</td>
</tr>
</tbody>
</table>


I. Introduction
   a. Rationale for Studying Dental Materials
   b. Biomaterials and the Oral Environment
   c. History and Selection of Dental Materials
   d. Standards for Dental Materials
   e. Classification of Dental Materials
   f. Classification of Dental Caries and Restorations
II. Materials Science and Dentistry
   a. Materials Science
   b. Atomic Bonding
   c. Materials and Their Atomic Bonds
III. Physical and Mechanical Properties of Dental Materials
   a. Properties of Materials
   b. Physical Properties
   c. Mechanical Properties
IV. Adhesive Materials
   a. Adhesive Materials in Dentistry
   b. Acid Etching
   c. Dentinal Bonding
   d. Glass Ionomers
   e. Uses of Bonding in Dentistry
V. Direct Polymeric Restorative Materials
   a. Acrylic Resins
   b. Inhibitors and Competing Reactions
   c. Problems with Unfilled Resins
   d. Improvements to Dental Resins
   e. Composite Materials
   f. Glass Ionomer Materials
   g. Composites
   h. Selecting Restorative Materials
VI. Amalgam and Direct Gold
    a. What is Dental Amalgam
    b. Advantages of Using Dental Amalgam
    c. History of Dental Amalgam
    d. Factors Affecting Handling and Performance
    e. Amalgam Properties
    f. Use of Dental Amalgam
    g. Direct Gold Restorations
VII. Dental Cements
     a. Use of Dental Cements
     b. Chemistry of Dental Cements
     c. Powders Used in Dental Cements
     d. Liquids Used in Dental Cements
     e. Powder/Liquid Ratios and Systems of Dental Cements
     f. ZOE Cement
     g. Zinc Phosphate Cement
     h. Glass Ionomer Cements
I. Polycarboxylate Cement  
J. Other Dental Cements and Cement Uses

VIII. Impression Materials  
a. Impression Materials  
b. Plaster  
c. Wax and Impression Compound  
d. Zinc Oxide-Eugenol (ZOE)  
e. General Aspects of Hydrocolloid Impression Materials  
f. Alginate Impression Materials  
g. Agar  
h. General Aspects of Nonaqueous Elastomeric Impression Materials  
i. Polysulfides  
j. Condensation Silicones  
k. Polyethers  
l. Addition Silicones

IX. Gypsum Materials  
a. Desirable Properties  
b. Types of Gypsum Products  
c. Setting Reaction  
d. Setting Time  
e. Setting Expansion  
f. Strength  
g. Surface Hardness  
h. Dimensional Stability

X. Materials for Fixed Indirect Restorations and Other Surgical Materials

XII. Speciality Materials  
a. Orthodontic Materials  
b. Endodontic Materials

XIII. Clinical Detection and Management of Dental Restorative Materials During Scaling and Polishing  
a. Clinical Detection of Tooth Structure and Dental Restorative Materials  
b. Suggestions for Polishing Specific Restorative Materials

XIV. Polishing Materials and Abrasion  
a. Definitions  
b. Types of Abrasives  
c. Bonded and Coated Abrasives  
d. Factors Affecting the Rate of Abrasion  
e. The Polishing Process  
f. Prophylaxis Pastes  
g. Air Powder Polishing  
h. Implants  
i. Denture Cleansers  
j. Dentifrices

XV. Tooth Whitening  
a. Treatment Options: Restoration or Whitening

Restorations and Protheses  
a. Types of Fixed Indirect Restorations  
b. Classification by Amount of Tooth Structure Restored  
c. Classification by Material  
d. Procedures for Constructing an Indirect Restoration  
e. Casting Process  
f. Alloys for All-Metal Cast Restorations  
g. Titanium  
h. Partial Denture Frameworks  
i. Ceramic Restorative Materials  
j. Advantages and Disadvantages

XI. Removable Prostheses and Acrylic Resins  
a. Acrylic Resins  
b. Acrylic Resin Systems Used in Dentistry  
c. Complete Dentures  
d. Constructing a Complete Denture  
e. Partial Dentures  
f. Relining a Denture  
g. Immediate Dentures  
h. Repairing Acrylic Prostheses or Appliances  
i. Handling Acrylic Devices

XVIII. Disinfection of Impressions, Dentures, and Other Appliances and Materials  
a. Disinfection of Impressions  
b. Disinfecting Dentures and Other Appliances  
c. Infection control Protocol for Grinding and Polishing Dentures

XIX. General Rules for Handling Dental Materials  
a. Follow the Manufacturer’s Directions  
b. Mixing and Setting Times  
c. Dispensing Materials  
d. Mixing  
e. Light-Activated Materials  
f. Contamination