DAT 113 – Dental Materials
Health Sciences – Expanded Duty Dental Assisting
Fall 2015

Catalog Course Description: This course is a study of physical and chemical properties of matter and identification, characteristics, and manipulation of dental materials.

Prerequisite(s): Acceptance into the dental assisting program

Credit Hours: 4.0 Total Credits  2.0 Lecture Credits  7.0 Lab Contact Hrs.

Departmental Website: http://www.midlandstech.edu/dental
D2L Brightspace Login Page: https://elearn.midlandstech.edu

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Program Assistant: Rhonda Kirkland, AC 342; 803-822-3439
Program Director: Elaine Evans, CDA, BHS

Class Schedule[s]: [Section number, Day, Time, Place]

Office Hours:

Textbook(s): Dental Materials Properties and Manipulation, 10th Edition, Craig, Powers, Wataha
Additional Textbooks/Readings: Modern Dental Assisting, Bird, Robinson, and Torres
Lab Manual Materials in Dentistry, E. Evans

Equipment: Lab instruments.

General Education Core Competency Statement: Emphasis will be placed on study of drug regulations and consumer safety. Each student is expected to successfully complete unit test designed from the course objectives with a 75% or higher.

Course Objectives: Upon completion of this course the student will be able to:

1. Describe the relationship between various individuals involved in providing quality dental materials to patients and explain why this relationship is essential to provide optimum dental service to the patient.
2. Identify equipment and explain the proper care of each, to include:
   a. amalgamator
   b. model trimmer
   c. lathe
   d. automatic spatulator - for use with impression materials
   e. gypsum vibrators
3. Define some of the characteristics associated with the physics and chemistry of matter and explain and compare matter to energy. Understand the properties of dental materials including; mechanical, Thermal, electrical, corrosive, solubility, flow, adhesion, wetting, viscosity, retention, curing, and composition.
4. Explain the uses of amalgam in dentistry. Also properly prepare acceptable mix of amalgam
5. List the chemical components of amalgam alloy and explain the effects of each component of the final amalgam mix.
6. Explain how to correct different improper consistencies that may occur in amalgam mixtures.
7. List the chemical components in the powder and the liquid of zinc phosphate cement and explain the effects on a mix if the composition is altered.
8. Explain the uses of zinc phosphate cement and compare the differences in technique in preparing each.
9. Properly prepare an acceptable mix of zinc phosphate cement according to its use and explain the effect of variations in technique on the properties: consistency, setting time, strength, solubility, and dimensional change.
10. Explain the primary use of a glass ionomer and list the components.
11. Properly prepare an acceptable mix of glass ionomer and explain the effect of variations in technique on the following properties: consistency of the mix, setting time of the mix, strength of set material, optical properties of mix and set material, and solubility of the set material.
12. List the uses of zinc oxide-eugenol cements and compare the differences in technique in preparing each.
13. List the chemical components in the powder and in the liquid of zinc oxide eugenol cement, glass ionomer cement, resin cement, and polycarboxylate cement.
14. Properly prepare an acceptable mix of zinc oxide-eugenol cement according to its use and explain the effect of variations technique on the following properties: consistency of mix, setting time of mix, strength of the set material, solubility of the set material and place and carve a medicated restoration in a dentoform.
15. List the uses of resin cements and bonding agents and the differences preparing each.
16. List the chemical components in a resin cement.
17. List the esthetic filling materials and explain and compare the differences and/or similarities of the technique used in their preparation.
18. Properly prepare an acceptable mix or preparation of any esthetic filling material according to its use and explain the effect of variation in technique on the following properties: consistency of mix, setting time of mix, compressive strength of set material, solubility of the set material.
19. Explain which dental cement is used in which cavity preparation and under which filling material.
20. List the types of gypsum products and compare their uses and origins.
21. Explain the effects of variations in the water: powder ratio, spatulation, chemical additives and insert fillers on the following properties of gypsum products: setting times, setting expansion, strength and hardness and produce an acceptable study cast.
22. Explain the precautions taken during the use and storage of gypsum products.
23. Identify the following impression materials: agar (reversible hydrocolloid), poly vinyl siloxane, alginate (irreversible hydrocolloid), polyether, and rubber base and be able to categorize them into: rigid impression materials, plastic impression materials, elastic impression materials, or rubber impression materials.
24. Classify resin materials according to heat cured resins and self-curing resins.
25. Name the main component of reversible hydrocolloid material and the derivation of this material.
26. Explain how to properly prepare reversible hydrocolloid material to provide an acceptable physical state for the reproduction of involved anatomy and explain the effects of variations in technique on the following properties: viscosity of the sol, gelation temperature, ability to reproduce detail, strength, set or resistance to deformation and dimensional stability.
27. Explain the primary uses of alginate or irreversible hydrocolloid.
28. Name the main component of the alginate powder.
29. Properly prepare an acceptable mix of alginate and explain the effect of variations in technique on the following properties: viscosity of the sol, setting time, the strength of the gel, and the dimensional stability of the gel.
30. Explain the primary use of impression and poly vinyl siloxane impression material.
31. Properly prepare an acceptable mix of poly vinyl siloxane impression material and explain the effect of variations in technique on the following properties: setting time, and fine detail reproduction.
32. Explain the primary use or uses of the following waxes: inlay wax, base plate wax, boxing wax, utility wax sticky wax, rope wax, and periphery wax.
33. Explain the general composition of dental waxes and properties common to all of them.
34. Explain the primary uses of the different types of gold-noble metal alloys.
35. Explain the process involved in fabricating a cast restoration to include the following: a wax pattern, investment materials used, investing procedure, and casting procedures.
36. Explain the difference between direct and indirect restorations and give examples of each.
37. Describe the function of provisional coverage for a crown and construct a provisional crown on a typodont.
38. Demonstrate model trimming.

Course Outcomes and Competencies:
Intended Course Outcome #1: Students will demonstrate an overall knowledge of the principles and uses of dental materials.

Course Competency (Performance Measurement): Students must achieve a 75% on the tests given throughout the course based on the course objectives.

Measurement Instrument, Success Criteria and Data Collection Cycle:
Success on the competency will be measured by tests given throughout the course. The tests are based on the course objectives which include dental material properties, the use and manipulation of dental cements, dental esthetic materials used for restorations, and dental gypsum products. Students must achieve a required score or higher on each test given throughout the course based on the course objectives.

Intended Course Outcome #2: Students will demonstrate effective manipulation of dental materials.

Course Competency (Performance Measurement): Students will achieve 75% or higher on each assigned laboratory assessment for cements, composite placement, alginate, gypsum, and study casts.

Measurement Instrument, Success Criteria and Data Collection Cycle:
Success on the competency will be measured by performance assessments on mixing cements, placement of composite material on a Typodont tooth, mixing alginate, using gypsum products, and constructing a study cast. Students must achieve a required score or higher on each assigned laboratory assessment.

Course Attendance: Students must not miss more than the class or lab meets weekly, i.e., class meets two times per week, maximum number of absences - two (2). It is the student’s responsibility to make-up all assignments and/or time missed due to absences. Make-up time shall be scheduled at the instructor’s convenience and can not be scheduled during regular class time. All late assignments will be dropped one letter grade for each day it is late. Missing 10 minutes of class constitutes an absence as well as unprofessional behavior. Tardiness (0-10 minutes late) of three times will equal one absence.
Arriving to class ten minutes late (or more) and leaving class earlier (ten minutes or more) constitutes an absence. A legitimate excuse must be presented before being allowed to makeup a missed test or lab assignment. Please note the following: You are responsible for all material and announcements presented, whether you are present or absent.

If the student exceeds the maximum allowable absences, a grade of “W” will be assigned. If the student is failing or it is past mid-semester, a grade of “WF” (F) will be assigned. Again, missing 10 minutes or more constitutes an absence.

**Withdrawal:** Should the maximum allowable absences (4) be exceeded prior to midterm, a "W" will be submitted to the registrar to be recorded on the student’s transcript. Should the maximum allowable absences be exceeded after midterm, a "W" will be submitted to the registrar if the student was passing the course at the time of withdrawal OR a "WF" will be submitted if the student was failing the course at the time of withdrawal.

NOTE: If the student withdraws during the beginning of the term, it is advisable to discuss this with the cashier’s office about any partial tuition refund. Withdrawal after midterm, either a "W" or "WF" is based on the grade on the last day of class attendance (a "W" if passing, a "WF" if not). "WF’s" are computed in GPA's and count as an "F". It is advised that the student consult the instructor prior to voluntarily withdrawing to avoid any confusion as to what grade you will receive. Withdrawals may affect current and future financial aid awards, the full time status of a student, as well as impact enrollment in future courses. The financial aid office must be consulted as well as the student’s advisor prior to withdrawing from a course.

**No Shows:** If you register for a course and decide not to attend for any reason, you must complete a drop form and process it through the student Records Office. You will not be automatically purged for non-attendance. If you do not submit a drop form, you will be responsible for course tuition and fees. By not officially dropping the course, you will incur a bill with the college that can only be addressed through the College’s Finance Office. The college’s refund policy and dates are posted each semester.

**Effective Spring 2015, the Student Ombudsman’s office will no longer be the initial point of contact for requesting No Shows to be processed. Students who incur a bill must contact the Finance Office.**

**Administrative Drop Requests:** A student requesting an Administrative Drop resulting from medical event, death of family member, and other extenuating circumstances experienced while enrolled at Midlands Technical College should be directed to the Student Ombudsman’s office. Our policy dictates a request must be made no later than 30 days after the affected term. Supporting documentation is required and must be received before the request can be processed. Once the request form is received along with supporting documentation, it takes approximately three weeks for processing. As a result of an approved Administrative Drop Request, the student may be granted a refund of tuition and fees.

**Military Withdrawal:** According to College Procedure 3.10.1, students having to withdraw from college because of Military Deployment (active duty personnel) while enrolled must complete a withdrawal form and submit to the Records Office along with a copy of military orders.

**Disabilities Statement:** The staff of Counseling and Career Services works to ensure that all educational programming and services are accessible to otherwise qualified students with disabilities. If you have a concern regarding the accessibility of websites, instructional materials, online courses and other electronic or information technology please contact Counseling and Career Services. It is the student's responsibility to self-disclose as a student with a disability and to request accommodations prior to beginning a program or course. Please contact the staff of Counseling and Career Services at 803-822-3505 (AC) or 803-738-7636 (BC) or via email at disability@midlandstech.edu if you have any questions or concerns.
D2L: The D2L course management system may be used as a component of this course. The instructor may post PowerPoint presentations/lecture notes on D2L as well as other resources. The instructor will notify the student if and when items are posted in D2L either in class or via the students’ email accounts. Please refer to D2L information at http://www.midlandstech.edu/onlinelearning/ for additional information on D2L.

D2L Brightspace Help:

Online Learning Support Help Desk: Technical questions related to the operation and use of D2L Brightspace can be answered from our Support Help Desk. A response will be provided within one business day.
To login: use your MTC e-mail account username and password.
(Student Username Example: georgeasmith)
(Faculty Username Example: smithg)

D2L Brightspace Assistance: Technical questions related to the operation and use of D2L Brightspace can also be answered by leaving a voicemail at (803) 822-3561, or emailing D2LHelp@midlandstech.edu. A response will be provided within one business day.

MyMTC Help: For MyMTC log-in issues please call 803-738-7888.

Academic Dishonesty: For more information about academic dishonesty, see the Academic Affairs Student Guidelines and Expectations attached.

If you are suspected of cheating, your instructor will inform you. You may explain or refute the allegation. If your instructor still thinks the charges are founded, you will be referred to the Office of the AVP, SDS. Documentation is submitted to the Office of the AVP, SDS, by the instructor. You will then meet with either Dr. Holloway or Mr. Hayden. After the meeting, you will receive a letter with the sanction grade of zero (0) and any other sanctions deemed appropriate. You have the right to file an appeal. Once the hearing and the notice of the right to appeal have been completed, the instructor will be notified to apply the sanction grade of zero (0).

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Course Requirements: Projects listed under course objectives. Students will write a research paper on a dental material.

Course Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Tests and Lab Grades</td>
<td>65%</td>
</tr>
<tr>
<td>Study Cast Project</td>
<td>5%</td>
</tr>
<tr>
<td>Final Cumulative Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Professional Demeanor</td>
<td>5%</td>
</tr>
</tbody>
</table>
Grading Scale:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>92-100</td>
<td>A</td>
<td>Superior Work</td>
</tr>
<tr>
<td>83-91</td>
<td>B</td>
<td>Good Work</td>
</tr>
<tr>
<td>75-82</td>
<td>C</td>
<td>Average Work</td>
</tr>
<tr>
<td>0-74</td>
<td>F</td>
<td>Unsatisfactory Work</td>
</tr>
</tbody>
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PLEASE NOTE: This is an abbreviated syllabus. Should change become necessary, the instructor reserves the right to adjust the requirements, pace, or scheduling of this course. Any change will be announced in class before it becomes effective.

Special Procedures: A courtesy call, text, or e-mail is requested if you anticipate being tardy or if you are going to be absent.

Classroom Rules/Other: Professional Responsibility includes, but is not limited to:

1. Appropriate appearance/cleanliness,
2. Professional demeanor,
3. Proper use of infection control,
4. Proper use of protection equipment for clients, others, and self
5. Time management (including promptness)
6. Teamwork responsibilities
7. Appropriate attire in lab
8. Hair is to be "clinically-acceptable" and appearance neat in lab
9. Out of respect for your peers, instructors and future clients, you will be expected to refrain from having offensive odors (i.e., smoking, perfume/cologne, or body odors)
10. Integrity – including honest self-evaluations,
11. Chewing gum is not appropriate in a professional setting.
   a. You will be expected to refrain from chewing gum in any lab or clinic setting.

Professional Responsibility
The “professionalism” portion of the Performance Standards Counseling Items policy will be in effect for this course. (See the ADEP student handbook for more details.)