



Western Technical College

10508113 Dental Materials

Course Outcome Summary

Course Information

Description	Prepares dental auxiliary students to handle and prepare dental materials such as liners, bases, cements, amalgam, resin restorative materials, gypsum products, and impression materials. They also learn to take alginate impressions on manikins and clean removable appliances. This course is aligned to serve students in the Dental Hygienist and Dental Assistant programs.
Career Cluster	Health Science
Instructional Level	Associate Degree Courses
Total Credits	2
Total Hours	54

Pre/Corequisites

Prerequisite 10508101 Dental Health Safety

Textbooks

Dental Materials – with Access. 4th Edition. Copyright 2021. Eakle, W. Stephen. Publisher: Elsevier Science. ISBN-13: 978-0-323-59658-9. Required.

Learner Supplies

Uniform: Black lab jacket, black pants, tennis shoes. **Vendor:** To be discussed in class. Required.

Safety Glasses. **Vendor:** Campus Shop. Required.

Utility Gloves. **Vendor:** To be discussed in class. Required.

Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Cultivate Passion: Increase Self-Awareness
3. Live Responsibly: Embrace Sustainability
4. Live Responsibly: Foster Accountability
5. Refine Professionalism: Act Ethically
6. Refine Professionalism: Improve Critical Thinking
7. Refine Professionalism: Participate Collaboratively
8. Refine Professionalism: Practice Effective Communication

Program Outcomes

1. DA-1 year: Manage infection and hazard control
2. DA-1 year: Perform advanced dental laboratory procedures
3. DA-1 year: Demonstrate professional behaviors, ethics, and appearance

Course Competencies

1. Manipulate gypsum products.

Assessment Strategies

- 1.1. by manipulating different gypsum products in a laboratory setting
- 1.2. by pouring various gypsum products using rubber molds

Criteria

You will know you are successful when

- 1.1. you select the correct instruments, materials, and supplies for manipulating gypsum products.
- 1.2. you perform all critical steps in the right order.
- 1.3. you wear personal protective equipment.
- 1.4. you follow safety procedures when working with any gypsum product.
- 1.5. you verbalize an explanation of the process as you perform it.
- 1.6. you prepare the gypsum product according to the manufacturer's direction.
- 1.7. you ensure the models poured from the gypsum product are free from bubbles.

Learning Objectives

- 1.a. Use dental terminology as related to gypsum appropriately.
- 1.b. Differentiate among dental plaster, stone and improved stone.
- 1.c. Assess the indication for use of each type of gypsum products.
- 1.d. Compare the strength and setting expansion for the various types of gypsum products.
- 1.e. Describe the composition and properties of gypsum products.
- 1.f. Explain the setting reaction of gypsum products.
- 1.g. Identify the factors that affect handling of gypsum products.
- 1.h. Describe the use of gypsum products.
- 1.i. Identify the armamentarium needed for manipulating various gypsum products.
- 1.j. Identify the steps in measuring, mixing, pouring, and separating various gypsum products.
- 1.k. Explain the process of disinfecting the cast/model or die.
- 1.l. Identify safety precautions used during preparation of gypsum products.

- 1.m. Identify personal protective equipment required.
- 1.n. Identify appropriate aseptic techniques during preparation of gypsum products.

2. Prepare liners, bases, and cements.

Assessment Strategies

- 2.1. by preparing liners, bases, and cements in a laboratory setting
- 2.2. without the use of references

Criteria

You will know you are successful when

- 2.1. you assemble correct setup for mixing calcium hydroxide, zinc oxide eugenol, zinc phosphate cement, polycarboxylate cement, glass ionomer cements, resin cement and any other intermediary cements as directed by instructor.
- 2.2. you dispense specific material according to the manufacturer's instructions.
- 2.3. you add the materials according to the manufacturer's directions.
- 2.4. you mix the material in the time limit designated by the manufacturer.
- 2.5. you verbalize an explanation of the process as you perform it.
- 2.6. you utilize infection control protocol.
- 2.7. you mix the intermediary material correctly for a base consistency.
- 2.8. you mix the intermediary material correctly for a luting consistency.
- 2.9. you place or transfer the intermediary material to the operator using the correct instrument.

Learning Objectives

- 2.a. Use dental terminology as related to liners, bases and cements appropriately.
- 2.b. Describe the use of dental cements as a luting agent, base/liner, filling material, temporary restoration, intermediate restoration, periodontal pack and temporary cement.
- 2.c. Differentiate the properties of liners, bases and cements (ie., physical and biological).
- 2.d. Explain the use of adhesives/bonding in relationship to restorative dentistry.
- 2.e. Describe the relative properties of the component of the liquids and powders of materials.
- 2.f. Explain the setting reaction of dental cements.
- 2.g. Identify the armamentarium needed for manipulation of each cement.
- 2.h. Describe the procedure for dispensing and mixing various materials.
- 2.i. Identify safety precautions used during preparation of liners, bases and cements.
- 2.j. Identify personal protective equipment required.
- 2.k. Identify appropriate aseptic techniques during preparation of liners, bases and cement.

3. Mix impression materials.

Assessment Strategies

- 3.1. by mixing various impression materials in a laboratory setting
- 3.2. without the use of references

Criteria

You will know you are successful when

- 3.1. you select the correct instruments, materials, supplies for mixing a variety of impression materials
- 3.2. you perform all critical steps in the right order.
- 3.3. you wear personal protective equipment.
- 3.4. you follow safety procedures.
- 3.5. you verbalize an explanation of the process as you perform it.
- 3.6. you mix the impression material correctly.
- 3.7. you transfer the impression material to the operator.

Learning Objectives

- 3.a. Use dental terminology as related to impression materials appropriately.
- 3.b. Differentiate among impressions, casts/models and dies.
- 3.c. Identify the various types of impression trays used with specific types of impression materials.
- 3.d. Classify and identify various waxes used in dentistry.
- 3.e. Assess the indication for use of each type of impression material.
- 3.f. Compare elastic and inelastic impressions materials.
- 3.g. Describe the composition and properties of impression materials.
- 3.h. Explain the setting reaction of impression materials.

- 3.i. Identify the factors that affect handling of impression materials.
- 3.j. Describe the use of impression materials.
- 3.k. Identify the armamentarium needed for mixing impression materials.
- 3.l. Identify the steps in preparing, mixing, loading a tray, and transferring various impression materials.
- 3.m. Explain the process of disinfecting the various impressions.
- 3.n. Identify safety precautions used during preparation of impression materials.
- 3.o. Identify personal protective equipment required.
- 3.p. Identify appropriate aseptic techniques during preparation of impression materials.

4. Produce alginate impressions.

Assessment Strategies

- 4.1. by loading, seating, and removing the impression tray, to obtain an acceptable alginate impression on a manikin/peer
- 4.2. by preparing a wax bite from a manikin/peer
- 4.3. without the use of references

Criteria

You will know you are successful when

- 4.1. you select the correct equipment and supplies needed to produce an alginate impression.
- 4.2. you perform all critical steps in the right order.
- 4.3. you position yourself correctly.
- 4.4. you wear personal protective equipment.
- 4.5. you follow safety procedures.
- 4.6. you verbalize an explanation of the process as you perform it.
- 4.7. you ensure the alginate impression meets the criteria for evaluating an alginate impression.

Learning Objectives

- 4.a. Identify the armamentarium and materials used to produce alginate impressions.
- 4.b. Identify the criteria needed for acceptable impressions.
- 4.c. Sequence the steps in producing an alginate impression.
- 4.d. Evaluate impression using stated criteria.
- 4.e. Describe the disinfection technique for alginate impressions.
- 4.f. Identify the waxes used to produce a bite registration.
- 4.g. Identify appropriate aseptic techniques when producing alginate impressions.
- 4.h. Determine safety procedures to follow during producing alginate impressions.

5. Prepare amalgam for a direct restoration.

Assessment Strategies

- 5.1. by preparing an amalgam capsule using a mechanical amalgamator in the laboratory
- 5.2. without the use of references

Criteria

You will know you are successful when

- 5.1. you select the correct instruments, materials, and supplies for mixing and placing an amalgam restorative material.
- 5.2. you perform all critical steps in the right order.
- 5.3. you position yourself correctly.
- 5.4. you wear personal protective equipment.
- 5.5. you follow safety procedures.
- 5.6. you employ manufacture's instructions for timing of the mix.
- 5.7. you place the matrix correctly.
- 5.8. you verbalize an explanation of the process as you perform it.

Learning Objectives

- 5.a. Use dental terminology as related to amalgam appropriately.
- 5.b. Describe the use of amalgam as a restorative material.
- 5.c. Describe the characteristics and properties of amalgam.
- 5.d. Identify the factors that affect handling of amalgam.
- 5.e. Compare the particle shapes of lathe cut, spherical, and admix alloys.
- 5.f. Explain the composition of conventional and high-copper amalgam.

- 5.g. Explain the setting reaction of amalgam.
- 5.h. Differentiate among the forms of amalgam.
- 5.i. Relate the use of adhesive/bonding materials with amalgam restorations.
- 5.j. Identify the steps of an amalgam procedure.
- 5.k. Identify the armamentarium needed for manipulation of amalgam.
- 5.l. Describe the mixing technique for amalgam.
- 5.m. Explain the effect of moisture contamination on an amalgam restoration.
- 5.n. Identify safety precautions used during preparation of amalgam restorations ie. mercury hygiene.
- 5.o. Identify personal protective equipment required.
- 5.p. Identify appropriate aseptic techniques during preparation of an amalgam restoration.

6. Prepare direct esthetic restorative materials.

Assessment Strategies

- 6.1. by preparing a direct esthetic restoration in a laboratory setting
- 6.2. without the use of references

Criteria

You will know you are successful when

- 6.1. you select the correct instruments, materials, supplies for mixing a direct resin restorative material.
- 6.2. you perform all critical steps in the right order.
- 6.3. you wear personal protective equipment.
- 6.4. you follow safety procedures when curing light is activated.
- 6.5. you verbalize an explanation of the process as you perform it.

Learning Objectives

- 6.a. Use dental terminology as related to direct esthetic restorations appropriately.
- 6.b. Describe the use of direct esthetic restorative materials.
- 6.c. Describe the characteristics and properties of various direct esthetic restorative materials.
- 6.d. Identify the factors that affect handling of direct esthetic restorative materials.
- 6.e. Compare the composition of direct esthetic restorative materials.
- 6.f. Differentiate among the types of direct esthetic restorative materials.
- 6.g. Explain the setting reaction of direct esthetic restorative materials.
- 6.h. Identify the steps in various direct esthetic restorative material procedures.
- 6.i. Relate the use of adhesive/bonding materials with direct esthetic restorative materials.
- 6.j. Identify the armamentarium needed for manipulation of direct esthetic restorative materials.
- 6.k. Describe the mixing technique for various direct esthetic restorative materials.
- 6.l. Identify safety precautions used during preparation of direct esthetic restorative materials.
- 6.m. Identify personal protective equipment required.
- 6.n. Identify appropriate aseptic techniques during preparation of liners, bases and cement

7. Clean removable appliances.

Assessment Strategies

- 7.1. by cleaning a removable appliance in the laboratory setting
- 7.2. without the use of references

Criteria

You will know you are successful when

- 7.1. you select the correct equipment and supplies to clean a removable appliance.
- 7.2. you perform all critical steps in the right order.
- 7.3. you wear personal protective equipment.
- 7.4. you follow safety procedures.
- 7.5. you verbalize an explanation of the process as you perform it.

Learning Objectives

- 7.a. Use dental terminology as related to cleaning removable appliances appropriately.
- 7.b. Differentiate among the various cleaning products.
- 7.c. Identify the steps in cleaning a removable appliance.
- 7.d. Describe the disinfection process when cleaning a removable appliance.
- 7.e. Identify safety precautions used during cleaning a removable appliance.
- 7.f. Identify personal protective equipment required.

7.g. Identify appropriate aseptic techniques during cleaning a removable appliance.

8. Fabricate models.

Assessment Strategies

- 8.1. by fabricating a set of models poured from an impression of a role play peer/patient in the clinic
- 8.2. without the use of references

Criteria

You will know you are successful when

- 8.1. you select the correct equipment and supplies needed to use a gypsum product to pour a model from an impression.
- 8.2. you perform all critical steps in the right order.
- 8.3. you wear personal protective equipment.
- 8.4. you follow safety procedures.
- 8.5. you create models that meet the criteria for evaluating models.
- 8.6. you write patient's records to show accurate, up-to-date documentation of treatment and services.

Learning Objectives

- 8.a. Use dental terminology related to models appropriately.
- 8.b. Review the armamentarium and materials used in fabricating models.
- 8.c. Identify the criteria needed for an acceptable model.
- 8.d. Sequence the steps in fabricating models.
- 8.e. Evaluate fabricated models using stated criteria.
- 8.f. Describe the disinfection technique for models.
- 8.g. Identify the personal protective equipment required.
- 8.h. Determine safety procedures to follow when fabricating models.

9. Trim models.

Assessment Strategies

- 9.1. by using a wax bite registration from a manikin or role play peer/patient in the clinic
- 9.2. by trimming a set of study models using a model trimmer
- 9.3. without the use of references

Criteria

You will know you are successful when

- 9.1. you select the correct equipment and supplies needed to trim study models.
- 9.2. you perform all critical steps in the right order.
- 9.3. you wear personal protective equipment.
- 9.4. you follow safety procedures.
- 9.5. you demonstrate the cast cuts used to trim a study model.
- 9.6. you trim models to meet the criteria for evaluating trimmed study models.
- 9.7. you write patient's records to show accurate, up-to-date documentation of treatment and services.

Learning Objectives

- 9.a. Use dental terminology related to models appropriately.
- 9.b. Identify the armamentarium and materials used in trimming models.
- 9.c. Identify the criteria needed for an acceptable trimmed model.
- 9.d. Sequence the steps in trimming, labeling and polishing models.
- 9.e. Evaluate trimmed models using stated criteria.
- 9.f. Identify the personal protective equipment required.
- 9.g. Determine safety procedures to follow when trimming models.

10. Create vacuum-formed oral appliances.

Assessment Strategies

- 10.1. by operating a vacuum forming machine
- 10.2. by creating an oral appliance (i.e. mouth guard, custom tray and whitening tray) on a model
- 10.3. using a vacuum forming machine in the laboratory
- 10.4. without the use of references

Criteria

You will know you are successful when

- 10.1. you select the correct equipment and supplies needed to prepare vacuum-formed oral appliances.
- 10.2. you perform all critical steps in the right order.
- 10.3. you wear personal protective equipment.
- 10.4. you follow safety procedures.
- 10.5. you create vacuum-formed oral appliances meet the criteria for evaluation.
- 10.6. you write patient's records to show accurate, up-to-date documentation of treatment and services.

Learning Objectives

- 10.a. Use dental terminology related to vacuum-former and vacuum-formed oral appliances appropriately.
- 10.b. Identify the armamentarium and materials used in vacuum-forming various oral appliances.
- 10.c. Identify the criteria needed for an acceptable vacuum-formed oral appliance.
- 10.d. Sequence the steps when using a vacuum former.
- 10.e. Sequence the steps in creating a vacuum-formed oral appliance.
- 10.f. Evaluate the vacuum-formed oral appliance using stated criteria.
- 10.g. Identify the personal protective equipment required.
- 10.h. Determine safety procedures to follow when using the vacuum former.