INSTRUCTOR: Carrie Johnson CDA, EFDA
OFFICE: RCH 201A

OFFICE HOURS: Posted
PHONE: 541-917-4495

E-MAIL: johnsonc@linnbenton.edu
CREDITS: 3 credits

EXTENT: Lecture - Wednesday 10:00 to 11:50
Labs - Wednesday 1:00-4:50

COURSE DESCRIPTION:
An introduction to laboratory applications in the handling and manipulating of dental materials is designed to improve proficiency and efficiency at chair-side procedures, emphasis on principles of physical and chemical properties of gypsum, impression materials, waxes, custom trays and basic principles and asepsis of laboratory procedures, including fixed prosthetic materials and gold products. Precautions and safe handling of dental laboratory materials will be presented through the use of Material Safety Data Sheets (MSDS).

COURSE OBJECTIVES:
Given a series of lectures on the physical and chemical properties of gypsums, waxes, impression materials, and gold procedures, the student will, at a level of 72% or higher, demonstrate the theory and knowledge of materials, and an understanding of their properties as they relate to manipulation in a dental office laboratory.

TEXTS AND REFERENCES:
Torres and Erhlich, Modern Dental Assisting; Tenth edition
Phinney, Donna, Dental Assisting, A Comprehensive Approach, Delmar
Dofka, Charline, Dental Terminology, Delmar
MSDS/Manufacturers Information
Phillips, Ralph Elements of Dental Materials; Fifth edition

Course grades will be determined by:
A = 92% - 100%
B = 82% - 91%
C = 72% - 81%
D = 65% - 71%
F = below 64%

SCHOLASTIC REQUIREMENTS:
To remain in the Dental Assistant Program, the student must achieve 72% or more for Dental Materials Lecture and 72% or more for Dental Materials Lab both independently.

GRADE POINT BREAKDOWN:

Attendance 22
Homework 37
Quizzes 169
Final 200
Lab 140
Total 568

EXAMINATIONS AND GRADES:
Course grades will be determined by a series of quizzes, homework assignments, attendance and final examinations and lab check-offs.
QUizzes:
Weekly quizzes are given. If absent, a make-up quiz must be completed on the day of your return to school. No quizzes after that date will be accepted. Extra credit on quizzes is only given for quizzes taken during original test time.

Student Contribution:
Two hours of study are required for each hour of lecture. Assignments are given and you are expected to read those assignments prior to class. It is impossible to cover all portions of every topic in the time allotted for each class. This means that you must accept the responsibility for the material that is not discussed in class. When you find that information is not clear, it is your right and responsibility to raise questions that will clarify these points. Additional information on topics is provided to you in your class pack. You are responsible for all information included in the handouts.

Weekly Assignments:
Weekly assignments are due at the beginning of class unless otherwise indicated by the instructor. No late homework will be accepted. It is your responsibility to get any missed notes or handouts from another student if you are absent. To get credit for homework done but not turned in when sick it must be turned in the very next day of your return to school. Homework will not be accepted after that first day back.
COURSE CONTENT:

Week: Tentative Schedule

1. Introduction/History/Importance of Dental Materials/Terminology/Materials and the Oral Environment/Physical and Biological Considerations/Classifications of Materials/Role of Hazardous Materials/Requirements for Handling/Safe Disposal

2. Structure and Properties/Solids/Adhesion/ Cohesion/Stress an Strain/Thermal Conductivity/Dental Laboratory Equipment/Care and Use/Disinfection/Aseptic Technique

3. Gypsum Products: Plaster/Dental Stone/Composition/Water-Powder Ratio/Setting Time/Expansion/Wet and Final Strength/Model Trimming Technique/Articulation of Models


5. Nonaqueous Elastomeric Impression Materials: Polyether/Polysulfide

6. Nonaqueous Elastomeric Impression Materials: Polysiloxane Rubber/Polyvinyl Siloxane

7. Review and Discussion of all Impression Materials

8. Dental Waxes: Periphery/Pink/Boxing/Blockout/Bite Rims /Custom Trays/Bite Blocks

9. Dental Abrasives/Polishing Agents/Discs/Aluminum Oxide/Pumice/Zirconium Silicate/Tin Oxide/Diamonds/Strips

10. Fixed Prosthetic Procedures/Gold/Palladium/Porcelain

11. Final Projects
INSTRUCTIONAL AND LEARNING OBJECTIVES:

After completion of Dental Materials I, the student will be able to:

1. Define the physical and biological characteristics of dental materials as they pertain to biting forces, microleakage and temperature effects.
2. Understand the structure and properties of dental materials.
3. Define the terminology used to discuss the structure and properties of dental materials.
4. Describe the factors and biological limitations that make demands on dental materials.
5. Identify the terms relating to metals used in dentistry: alloys and cast structures.
6. Discuss resins used in dentistry with regard to composition and characteristics.
7. Describe thermal conductivity and thermal expansion and state why they are important.
8. Discuss adhesion in terms of: viscosity, contact angle, wetting, film thickness and surface tension.
9. Compare dental stone and plaster in terms of composition, water/powder ratio, setting time, expansion and final strength.
10. Compare dental impression materials in terms of their composition, characteristics and application in dentistry.
11. Identify the following terms: force (tensile, compressive, shearing), stress, strain, elasticity, and strength.
12. Differentiate between ductility and malleability and identify the following: flow, hardness, relaxation and distortion.
13. Describe the primary characteristics, component, ingredients and uses of inlay/baseplate/sticky/boxing and utility waxes.
14. Describe gold foil manipulation, annealing and condensing.
15. Describe the use of custom trays
17. Discuss reversible vs. irreversible colloids.
18. State the advantages of using elastomeric impression materials, and list the three types.
19. Describe the three major steps involved in producing accurate dental diagnostic casts.
20. Discuss the laboratory uses and properties of: glutaraldehyde, chlorine dioxide, iodophors, synthetic phenol compounds and sodium hypochlorite.
In addition to objectives 1-21, the following procedures will be performed to laboratory competence:

1. Demonstrate trimming and finishing maxillary and mandibular diagnostic casts. Both plaster and Stone.
2. Demonstrate construction and finishing of a Sports Guard
3. Demonstrate construction/finishing of a custom tray.
4. Demonstrate the method used for producing a desirable hydrocolloid impression.
5. Demonstrate procedure for a desirable alginate impression.
6. Demonstrate preparing polysulfide impression material for both the syringe and tray using the back-fill syringe technique.
7. Demonstrate preparing polyether impression material.
8. Demonstrate preparing polysiloxane impression material.
9. Demonstrate the extruder gun technique

In addition, the student will show competence in:

1. Knowledge of emergency procedures/locate the first aid kit
2. Knowledge and use of MSDS sheets
3. Demonstrate the use and care of the model trimmer and lathe.
4. Demonstrate use and care of the Vacuum former