DLT 126 Advanced Crown and Bridge

COURSE DESCRIPTION:

Prerequisites: DLT-123
Corequisites: None

This course introduces techniques for fabricating advanced fixed restorations. Topics include resin veneers, temporary crowns, post-core crowns, overdenture copings, non-parallel bridges, and semi-precision attachments. Upon completion, students should be able to fabricate advanced fixed restorations. Course Hours Per Week: Class, 1. Lab, 9. Semester Hours Credit, 4.

LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Interpret dental prescriptions.
2. Identify anatomic landmarks of the adult dentition.
3. Explain procedures for fabricating single and multiple unit restorations.
4. Demonstrate an understanding of restoration design principles in analog and digital workflows.
5. Identify and trim margins.
6. Incorporate principles of occlusion using occlusal compass concepts, including occlusal stress.
7. Form wax patterns using advanced concepts of drop wax technique in articulation.
8. Identify materials used to fabricate, interim, digital, post, and implant crowns.
9. Form digital restorations and STL files for 3D printing and/or milling.
10. Seat fixed restorations on respective dies and adjust occlusion.
11. Finnish and polish fixed analog and digital crowns and bridges.
12. Construct interim restorations.

OUTLINE OF INSTRUCTION:

I. Diseases that be contracted in the dental laboratory
   - A. Lecture – review of infection control
     1. Types of diseases that may be contracted
     2. Various methods that can be taken to reduce the risk of disease
   - B. References:
     1. Infection control and management of hazardous materials for the dental team by Miller, Chris H. (Microbiologist). 2018, 6th edition.
     2. Basic guide to infection prevention and control in dentistry by Pankhurst, Caroline; Coulter, Wilson. 2017, Second edition.

II. Introduction to Dental Implants
   - A. Classroom lecture
     1. History or implants
     2. Implant parts
     3. Implant uses in fixed restorations
   - B. References:
     1. Dental implant prosthetics by Misch, Carl E. 2015
     2. Contemporary implant dentistry by Misch, Carl E. 2008, 3rd ed.
     3. Dental implants: the art and science by Babbush, Charles A. 2011, 2nd ed.

III. Principles of constructing a digital crown (CAD/CAM)
   - A. Classroom Lecture
     1. Varieties of software systems

2. Prescription overview
3. Scanning and Importing the models
4. Designing steps
5. Milling
6. How it should be nested
7. Sintering Process

B. Laboratory demonstration
1. Scanning
2. Designing
3. Milling
4. Sintering

C. References:
1. Manufacturer manuals
2. Fundamentals of CAD/CAM Dentistry by Jonathan L. Ferencz (Author), Nelson R.F.A Silva (Author). 2019
3. Wheeler's dental anatomy, physiology, and occlusion by Nelson, Stanley J. 2015, Tenth edition.

IV. Finishing and Polishing of a milled crown

A. Classroom lecture
1. Contouring the crown
2. Staining the crown
3. Polishing the crown

B. Laboratory Demonstration
1. Contouring
2. Staining
3. Polishing

C. References:
1. Manufacturer manuals

V. Interim Restorations

A. Classroom lecture
1. Purpose for interim restorations
2. Types of interim restorations
3. Methods of construction

B. Laboratory demonstration
1. Vacuum forming
2. Packing and curing
3. CAD/CAM
4. Finishing and polishing

C. References:
1. Dental Laboratory Technology. Fixed and Special Prosthodontics. Airforce Manual. Vol. II. 2009
2. Principles of design and fabrication in prosthodontics by Hohmann, Arnold; Hielscher, Werner. 2016

VI. Attachments

A. Classroom Lecture
1. Reasons for attachments
2. Types of attachments
3. Applications of attachments

B. References:

1. Dental Laboratory Technology. Fixed and Special Prosthodontics. Airforce Manual. Vol. II. 2009
2. Clinical and laboratory manual of implant overdentures by Shafie, Hamid R. 2007
3. Precision attachments: a link to successful restorative treatment by Jenkins, Gareth. 1999

VII. Post and Core
- A. Classroom Lecture
  1. Definition and types
  2. Objectives
  3. Materials
  4. Fabrication
- B. Laboratory Demonstration
  1. Forming the wax patterns
- C. References:
  1. Dental Laboratory Technology. Fixed and Special Prosthodontics. Airforce Manual. Vol. II. 2009
  2. Principles of design and fabrication in prosthodontics by Hohmann, Arnold; Hielscher, Werner. 2016

VIII. Occlusion
- A. Classroom Lecture
  1. Principles of occlusion
  2. Determinants of occlusal morphology and physiology
  3. Occlusal Compass Concepts
- B. Laboratory Demonstration
  1. Building with drop wax and occlusal compass techniques
  2. Excursive movements on Hanau 2 articulator
- C. References:
  1. Dental Laboratory Technology. Fixed and Special Prosthodontics. Airforce Manual. Vol. II. 2009
  2. Waxing for dental students by Abdalla, Rowida. 2018
  3. Occlusion: principles and concepts by Santos Júnior, José dos. 1985
  4. Guide to occlusal waxing by Shillingburg, Herbert T; Wilson, Edwin L; Morrison, Jack T. 1984, 2nd ed.

IX. 3D Printing
- A. Classroom Lecture
  1. Purpose of 3D modeling
  2. File types and programs
- B. Laboratory Demonstration
  1. Digital manipulation with 3D objects
  2. Importing and exporting STL files
  3. Correcting existing STL files
- C. References:
  1. Manufacturer manuals

REQUIRED TEXTBOOK AND MATERIAL:

1. Principles of design and fabrication in prosthodontics by Hohmann, Arnold; Hielscher, Werner. 2016
2. Wheeler's dental anatomy, physiology, and occlusion by Nelson, Stanley J. 2015, Tenth edition.
3. Dental Laboratory Technology. Fixed and Special Prosthodontics. Airforce Manual. Vol. II. 2009

SUGGESTED REFERENCES:

1. Mosby's dental dictionary by Zwemer, Thomas J. 2007, 2nd ed.
2. Dental anatomy coloring book by Fehrenbach, Margaret J. 2014, 2nd ed.
3. Fundamentals of CAD/CAM Dentistry by Jonathan L. Ferencz (Author), Nelson R.F.A Silva (Author). 2019