Florida Department of Education
Curriculum Framework

Program Title: **Dental Laboratory Technology and Management**
Career Cluster: **Health Science**

AAS	
CIP Number	0351060301
Program Type	College Credit
Standard Length	68 credit hours
CTSO	HOSA: Future Health Professionals
SOC Codes (all applicable)	11-9111 Medical and Health Services Managers
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Health Science career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Health Science career cluster.

The content includes but is not limited to, general studies, physical sciences, dental sciences, dental laboratory techniques, dental laboratory management and business principles, computer applications in the dental laboratory, leadership and communications skills.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 68 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Identify the anatomic structure and function of body systems in relation to prosthetic services performed by the dental laboratory technician
02.0 Practice quality assurance, safety and infection control.
03.0 Adhere to legal and ethical principles related to the practice of dental laboratory technology.
04.0 Demonstrate knowledge of effective business management techniques.
05.0 Demonstrate knowledge of dental sciences.
06.0 Demonstrate knowledge of physical and mechanical properties of metals and alloys.
07.0 Manufacture various methods of complete denture construction.
08.0 Manufacture complete denture construction on practical work received from dental clinic.
09.0 Manufacture and identify components of a removable partial denture.
10.0 Manufacture orthodontic and pedodontic appliances.
11.0 Demonstrate knowledge and skills required to manufacture single and multi-unit restorations.
12.0 Perform basic occlusion, determinants of occlusal morphology and physiology of mandibular movements.
13.0 Manufacture restorations in the student's specialty for patients who receive treatment at the dental research clinic.
14.0 Demonstrate knowledge of basic concepts of porcelain-fused-to-metal (PFM) techniques.
15.0 Demonstrate proper design and fabrication for individual and three-unit anterior bridge for pressable system restorations.
16.0 Demonstrate proper design and fabrication for all Ceramics Restorations using Refractory System.
17.0 Demonstrated knowledge of the Standard Components for Implant Systems.
18.0 Demonstrate proper design and fabrication for Implants System.
19.0 Describe the Standard Components and fabrication of semi precision attachments.
20.0 Demonstrate proper design and fabrication of Hybrid Restoration.
21.0 Specialization Removable Appliances: Demonstrate their skills in removable dentures on specific projects.
22.0 Perform select proficiency in fixed restorative techniques in chosen areas of specialization.

Florida Department of Education
Student Performance Standards

Program Title: **Dental Laboratory Technology and Management**
CIP Number: **0351060301**
Program Length: **68 credit hours**
SOC Code(s): **11-9111**

The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:	
01.0	Identify the anatomic structure and function of body systems in relation to prosthetic services performed by the dental laboratory technician.--The student will be able to:
01.01	Identify structures and functions of head and neck anatomy.
01.02	Identify embryonic development of head, oral cavity and individual teeth.
01.03	Identify each tooth and its landmarks.
02.0	Practice quality assurance, safety and infection control.--The student will be able to:
02.01	Practice safety in accordance with institutional policy.
02.02	Identify documentation procedures necessary to comply with state laws.
02.03	Demonstrate knowledge of the dental laboratory technician's role in providing quality assurance in laboratory procedures, reporting, and use and maintenance of equipment.
02.04	Use appropriate dental terminology and abbreviations.
02.05	Demonstrate knowledge, principles, and methods of disease transmission and prevention as related to dental prostheses.
02.06	Demonstrate knowledge of infection control in dental laboratories in accordance with Center for Disease Control (CDC)/OSHA guidelines.
02.07	Establish an infection control procedures policy for the dental laboratory.
03.0	Adhere to legal and ethical principles related to the practice of dental laboratory technology.--The student will be able to:
03.01	Demonstrate knowledge of the importance of observing the doctor/technician relationship.
03.02	Demonstrate knowledge of state law governing the practice of Dental Laboratory Technology.

04.0	Demonstrate knowledge of effective business management techniques.--The student will be able to:
04.01	Demonstrate knowledge and use of an office/laboratory procedure manual.
04.02	Demonstrate knowledge and use of business finance and operating expenses.
04.03	Demonstrate knowledge of pay scale and benefit program for employees and a bookkeeping system.
04.04	Demonstrate knowledge of tax forms, payroll records, insurance needs and inventory needs.
04.05	Demonstrate knowledge of employee hiring orientation.
04.06	Demonstrate knowledge of computer applications in the dental laboratory.
05.0	Demonstrate knowledge of dental sciences--The student will be able to:
05.01	Demonstrate knowledge of physical properties, use and manipulation of dental materials.
05.02	Demonstrate knowledge of the dynamics of occlusion.
05.03	Demonstrate problem-solving skills as related to dental materials.
06.0	Demonstrate knowledge of physical and mechanical properties of metals and alloys.--The student will be able to:
06.01	Identify how dental materials are affected by changes in the physical and mechanical properties of the materials.
06.02	List characteristics of a metal.
06.03	Identify the mechanical properties of cast alloys and cold worked metal, strain hardening, recrystallization, and grain growth.
06.04	Identify the metals and percentages in all types of dental casting gold alloys and how different alloys of dental gold casting affect the dental restorations.
06.05	Identify heat treatment techniques for dental casting gold alloys.
06.06	List the types, composition and uses of dental solders.
06.07	Identify composition and uses of dental fluxes and pickling agents.
06.08	Identify composition, physical and mechanical properties and heat treatment techniques for base metal alloys, chrome cobalt and nickel chrome.
06.09	Identify types of burs used in dentistry and the mechanics of cutting.
06.10	Identify abrasion and polishing dentifrices used in the dental lab and how each affects the dental restoration.
07.0	Manufacture various methods of complete denture construction.--The student will be able to:

	07.01	Make casts by pouring all types of impression material to include dentulous and edentulous impressions.
	07.02	Construct base plates by either the light cure and/ or thermoforming vacuum press.
	07.03	Construct wax occlusion rims to exact specifications.
	07.04	Articulate cast upon which complete dentures are to be made on 1 plain line and semi adjustable articulators.
	07.05	Set-up and wax-up complete upper and lower dentures.
	07.06	Manufacture temporary all-acrylic removable partial dentures.
	07.07	Repair any and all types of dentures.
	07.08	Manufacture immediate complete dentures complete with surgical tray.
	07.09	Relining complete dentures (upper and lower).
	07.10	Perform selective milling grinding in the finishing of complete dentures.
08.0	Manufacture complete denture construction on practical work received from dental clinic. --The student will be able to:	
	08.01	Make stone or plaster casts by pouring all types of impressions, both dentulous and semi-edentulous impressions, be it alginate, rubber base or silicone.
	08.02	Construct a light cure or thermoformed vacuum base plate and stabilized tray if so ordered on the prescription by the doctor.
	08.03	Construct wax occlusal rim to exact measurements.
	08.04	Be able to articulate casts on a plain line or semi-adjustable articulator.
	08.05	Set-up and wax-up cases.
	08.06	Invest, pack, cure, deflask, finish, and polish.
	08.07	Repair dentures, flange, adding teeth or clasp if needed to denture.
	08.08	Reline any upper or lower denture.
09.0	Manufacture and identify components of a removable partial denture. --The student will be able to:	
	09.01	Survey and design maxillary and mandibular removable partial denture framework.
	09.02	Block out and duplicate master cast.
	09.03	Identify, explain, and use a variety of clasps.

	09.04 Wax-up, sprue, invest, burnout and cast non-precious alloy frames.
	09.05 Finish and polish metal frames and arrange artificial teeth.
	09.06 Demonstrate the bending of wrought wire and perform various repairs.
10.0	Manufacture orthodontic and pedodontic appliances. --The student will be able to:
	10.01 Identify and describe various types of malocclusion as presented in the course.
	10.02 Identify and know the treatment objectives of the orthodontic appliances presented in the course.
	10.03 Interpret work authorization for orthodontic appliances.
	10.04 Complete the assigned laboratory exercises in the course to the standard of clinically acceptable quality.
11.0	Demonstrate knowledge and skills required to manufacture single and multi-unit restorations.--The student will be able to:
	11.01 Pour impression to make casts with removable dies.
	11.02 Articulate casts on a semi-adjustable articulator and use various types of articulation systems.
	11.03 Prepare dies for waxing.
	11.04 Manufacture wax patterns for inlays, onlays, full crowns and multi-unit restorations.
	11.05 Demonstrate proper techniques in spruing, investing and casting.
	11.06 Finish all metal cast restorations.
	11.07 Demonstrate a proper diagnostic wax-up for single and multi-unit restorations.
	11.08 Demonstrate the fabrication of provisional restoration using thermoforming vacuum or putty matrix methods.
	11.09 Construct a single and multi-unit restoration.
	11.10 Finish provisional restoration in an acceptable manner.
	11.11 Construct a post and core with a final restoration.
12.0	Perform basic occlusion, determinants of occlusal morphology and physiology of mandibular movements.--The student will be able to:
	12.01 Identify fundamental occlusion patterning associated with the basic mandibular positions.
	12.02 Identify Dr. Angle’s occlusal classifications.

	12.03 Identify cusp types from the functional point of view.
	12.04 Identify the incisal edges and cusps tips of maxillary teeth to mandibular teeth in centric occlusion.
	12.05 Demonstrate the correlation between maxillary and mandibular cusps.
	12.06 Demonstrate an understanding of mandibular movements.
	12.07 Demonstrate an understanding of functional occlusion.
13.0	Manufacture restorations in the students specialty for patients who receive treatment at the dental research clinic.--The student will be able to:
	13.01 Complete denture set-up, wax-up and finish.
	13.02 Perform basic complete denture relines.
	13.03 Demonstrate knowledge of denture repairs.
	13.04 Removable partial denture wax-up, casting and finish.
	13.05 Manufacture a Hawley appliance.
	13.06 Manufacture space maintainer.
	13.07 Fabricate restorations to include: inlay, onlays, full crowns, bridges Porcelain Fused to Metal (PFM) and all ceramic restorations.
	13.08 Manufacture prostheses for patients currently under treatment or from actual casts or impressions and occlusal records from previously fabricated prosthesis.
14.0	Demonstrate knowledge of basic concepts of porcelain-fused-to-metal (PFM) techniques.--The student will be able to:
	14.01 Describe the components of dental porcelain.
	14.02 Describe the early porcelain-fused-to-metal systems.
	14.03 Identify various alloys used in the fabrication of PFM restorations.
	14.04 Identify and explain the uses of opaque, body, incisal, modifier, glaze and stain porcelains.
	14.05 Demonstrate proper metal design for individual and multiple-unit PFM restorations.
	14.06 Demonstrate proper spruing, investing, burnout, casting and metal finishing techniques.
	14.07 Demonstrate proper and accurate pre-soldering skills.
	14.08 Demonstrate proper and accurate post-soldering skills.

	14.09 Describe the concept of degassing and metal porcelain bonding.	
	14.10 Demonstrate approved techniques for opaque, body and incisal porcelain application.	
	14.11 Identify various porcelain firing cycles.	
	14.12 Demonstrate approved techniques for contouring and glazing porcelain.	
	14.13 Describe the basic concepts of staining, the color wheel and hue, chroma and value.	
	14.14 Demonstrate and understanding of porcelain furnace calibration and maintenance.	
15.0	Demonstrate proper design and fabrication for individual and three-unit anterior bridge for pressable system restorations. -- The student will be able to:	
	15.01 Demonstrate proper wax-up, spruing and investing.	
	15.02 Demonstrate proper burnout and pressing.	
	15.03 Demonstrate proper recovery/ divesting of a pressed crown and bridge.	
	15.04 Demonstrate proper finishing techniques of a pressed crown and bridge.	
16.0	Demonstrate proper design and fabrication for all Ceramics Restorations using Refractory System. -- The student will be able to:	
	16.01 Pour impression to make casts with removable dies.	
	16.02 Fabrication of Inlays, Onlays and Veneers using the Refractory System.	
17.0	Demonstrated knowledge of the Standard Components for Implant Systems. -- The student will be able to:	
	17.01 List the standard components of an implant system including:	
	17.01.01	Implant / fixture
	17.01.02	Healing Abutment Cover Screw/ Screw
	17.01.03	Abutment
	17.01.04	Temporary Components
	17.01.05	Angulated Abutment
	17.01.06	Impression Coping
	17.01.07	Open tray/closed tray

	17.01.08	Abutment replicas
	17.01.09	Analogue/ Implant Replica
18.0	Demonstrate proper design and fabrication for Implants System. --The student will be able to:	
	18.01	Demonstrate the fabrication of a Custom Tray for an Implant Case.
	18.02	Demonstrate the fabrication of a Surgical Guide Template.
	18.03	Demonstrate the pouring of an impression and fabricate a master cast with an abutment replica in place.
	18.04	Apply soft tissue silicone material around the abutment replica.
	18.05	Screw/Cement-Retained, Castable Substructure.
	18.06	Demonstrate proper substructure design: waxing, spruing, investing, burnout, casting and metal finishing techniques for Implant Systems.
	18.07	Demonstrate proper design and fabrication of a porcelain fused to metal crown over an implant abutment.
	18.08	Demonstrate approved techniques for opaque, body and incisal porcelain application for Implant Systems.
19.0	Describe the Standard Components and fabrication of semi precision attachments. -- The student will be able to:	
	19.01	Explain the uses of attachments and stress breakers.
	19.02	Define and explain basic attachments groups and impression needed.
	19.03	Attachment Selection.
	19.04	Demonstrate proper design and fabrication of a Semi Precision Attachment.
	19.05	Explain the advantages and disadvantages of attachments.
	19.06	Semi Precision Attachments versus Precision Attachments.
20.0	Demonstrate proper design and fabrication of Hybrid Restoration. -- The student will be able to:	
	20.01	Fabricate a Bar and Clip Retained Overdenture.
	20.02	Fabricate Custom Tray and Master Cast.
	20.03	Fabricate Baseplate and Occlusion Rims.
	20.04	Articulation and Trial Denture.

	20.05 Fabricate a Bar.
	20.06 Demonstrate proper design and fabrication of a Denture over Implants with a Bar.
21.0	Specialization Removable Appliances: Demonstrate their skills in removable dentures on specific projects.--The student will be able to:
	21.01 Survey and design a maxillary and mandibular removable partial denture.
	21.02 Identify and explain the use of wax in a wide variety of clasps.
	21.03 Duplicate master casts.
	21.04 Sprue and invest waxed partial denture castings.
	21.05 Finish and polish a removable partial denture casting.
22.0	Perform select proficiency in fixed restorative techniques in chosen areas of specialization.--The student will be able to:
	22.01 Manufacture fixed restorations more quickly and with increased skill.
	22.02 Demonstrate a thorough understanding of the procedures involved in the fabrication of fixed restorations.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Laboratory activities are integrated with the didactic portion of this program. Students perform representative tasks in the manufacture of custom made dental devices and become involved in the dental health team through first hand observation in clinical procedures as they relate to laboratory techniques.

Special Notes

The program is designed to prepare students for entry level employment as dental laboratory technicians, dental laboratory managers, dental laboratory owners, marketing/sales personnel of dental products or SOC Code 11-9111 (Medical and Health Services Managers) or to provide supplemental training for persons previously or currently employed in this occupation. The Health Careers Core must be taken by all students (secondary, postsecondary adult and postsecondary vocational) planning to complete any Health Occupations program. Once successfully completed, the core does not need to be repeated at any instructional level.

Reinforcement of basic skills in English, mathematics and science appropriate for the job preparatory programs occurs through college level instruction, applied laboratory procedures or practice, clinical observation and involvement in the dental health care delivery team concept.

The program will include theoretical aspects of subjects as well as the practical applications. The theoretical aspects of the curriculum will provide content necessary for students to make judgments regarding the procedures they are expected to perform.

This program meets the Department of Health HIV/AIDS Domestic Violence and Prevention of Medical Errors education requirements. Upon completion of this program, the instructor will provide a certificate to the student verifying that these requirements have been met.

If students in this program are seeking a licensure, certificate or registration through the Department of Health, please refer to 456.0635 F.S. for more information on disqualification for a license, certificate, or registration through the Department of Health.

The program should meet the requirements of the Commission on Dental Accreditation of the American Dental Association. Students should be prepared to take the recognized graduate examination offered by the National Board for Certification in Dental Laboratory technology, Inc.

Outcomes 01-11 are referred to as the Health Careers Core and do not have to be completed if the student has previously completed the Core in another health science program. The Core should be taken first or concurrently with the first course in the program. Following the successful completion of the core, the student is eligible to take the National Health Care Foundation Skill Standards Assessment with instructor approval and the completion of a portfolio.

Career and Technical Student Organization (CTSO)

HOSA: Future Health Professionals is the intercurricular career and technical student organization providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:
http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml