



8670

INTRODUCTION TO DENTAL
CERAMIC TECHNOLOGY (12C)

40S/40E/40M

A Dental Technology Course

8670: INTRODUCTION TO DENTAL CERAMIC TECHNOLOGY (12C) 40S/40E/40M

Course Description

This course introduces the study of dental ceramic technology. Students manipulate materials to construct a variety of ceramic-fused-to-metal restorations. The course includes the study of anatomy, aesthetics, function, and colour to help introduce the science of various dental restorations.

Goal 1: Describe and apply appropriate **health and safety** practices as they relate to dental technology.

GLO 1.1: Create and maintain a **safe working environment** in a dental laboratory.

- SLO 12C.1.1.1: Demonstrate safe work procedures related to equipment, tools, and materials associated with dental ceramics.
- SLO 12C.1.1.2: Demonstrate the ability to identify and report potential hazards associated with dental ceramics.
- SLO 12C.1.1.3: Demonstrate the appropriate use of personal protective equipment (PPE), such as goggles, face masks, vinyl gloves, and laboratory coats.
- SLO 12C.1.1.4: Demonstrate the ability to identify worn, defective, and expired PPE and safety equipment.
- SLO 12C.1.1.5: Demonstrate knowledge of safety equipment, such as a fire extinguisher, a first aid kit, and an eyewash station.
- SLO 12C.1.1.6: Demonstrate the safe use of rotary tools and lathes associated with dental ceramics.
- SLO 12C.1.1.7: Demonstrate the safe use of sharp tools, such as scalpels and carving instruments.
- SLO 12C.1.1.8: Demonstrate and use infection-control techniques and apply universal safety precautions to prevent cross-contamination.
- SLO 12C.1.1.9: Demonstrate the safe use of Bunsen burners and alcohol torches.
- SLO 12C.1.1.10: Discuss workplace health and safety.
- SLO 12C.1.1.11: Describe how *The Workers Compensation Act* relates to the workplace.

SLO 12C.1.1.12: Describe the Workplace Hazardous Materials Information System (WHMIS) as it pertains to the dental laboratory environment.

SLO 12C.1.1.13: Describe the purpose of material safety data sheets (MSDS).

SLO 12C.1.1.14: Review emergency-planning procedures.

Goal 2: Demonstrate the safe and appropriate **operation, cleaning, maintenance, management, handling, and storage** of **equipment, tools, and materials**.

GLO 2.1: Demonstrate the safe and appropriate **operation** of **equipment and tools**.

SLO 12C.2.1.1: Demonstrate safe work procedures and the appropriate operation of equipment and tools associated with ceramic technology.

GLO 2.2: Demonstrate the safe and appropriate **cleaning, maintenance, and management** of **equipment and tools**.

SLO 12C.2.2.1: Demonstrate the appropriate cleaning, maintenance, and management of equipment and tools associated with ceramic technology.

GLO 2.3: Demonstrate the safe and appropriate **handling and storage** of restorative dental **materials**.

SLO 12C.2.3.1: Demonstrate the appropriate handling and storage of restorative dental materials associated with ceramic technology.

Goal 3: Demonstrate an understanding of the **science and characteristics** of various **restorative dental materials**.

GLO 3.1: Demonstrate an understanding of the **science and characteristics** of various **restorative dental materials**.

SLO 12C.3.1.1: Demonstrate an understanding of the physical characteristics and appropriate use of various ceramic, refractory, and gypsum materials associated with ceramic technology.

SLO 12C.3.1.2: Demonstrate an understanding of the chemical characteristics and appropriate use of various stains, metal oxides, and ceramic, investment, and gypsum materials associated with ceramic technology.

SLO 12C.3.1.3: Demonstrate an understanding of the mechanical characteristics and appropriate use of various materials associated with ceramic technology.

GLO 3.2 Demonstrate an understanding of **metallurgy and the characteristics of acrylics** used in dental appliances.

- SLO 12C.3.2.1: Demonstrate an understanding of and the manipulation of various ceramic materials used in the design and fabrication of ceramic restorations and composites.
- SLO 12C.3.2.2: Demonstrate an understanding of the structures of ceramic and composite materials, fusing points, and layering effects associated with ceramic technology.
- SLO 12C.3.2.3: Demonstrate an understanding of organic and inorganic elements in ceramic and composite materials.
- SLO 12C.3.2.4: Demonstrate an understanding of tension and tensile strength, shear strength, yield strength, and chemical and mechanical cohesion with regard to porcelain-fused-to-metal structures.
- SLO 12C.3.2.5: Demonstrate and describe the coefficient of thermal expansion as it applies to ceramic fusing techniques.
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Goal 4: Demonstrate the **functional design** of dental appliances.

GLO 4.1: Demonstrate the **functional design** of dental appliances.

- SLO 12C.4.1.1: Demonstrate an understanding of the importance of proper application of opaque, dentin, and enamel in single-unit restorations.
- SLO 12C.4.1.2: Demonstrate an understanding of shape and contour in anterior restorations.
- SLO 12C.4.1.3: Demonstrate an understanding of the importance of proper functional design in the fabrication of multiple-unit ceramic bridges.
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Goal 5: Demonstrate the **fabrication** of dental appliances.

GLO 5.1: Demonstrate the **fabrication of the components** used in dental appliances.

- SLO 12C.5.1.1: Demonstrate the application of ceramics to metal substructures.
- SLO 12C.5.1.2: Demonstrate the preparation of alloy substructures during the thermocycling stage.
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GLO 5.2: Demonstrate the **fabrication** of dental appliances from their various components.

SLO 12C.5.2.1: Demonstrate the use of ceramics and their application to single anterior substructures.

SLO 12C.5.2.2: Demonstrate the trimming and shaping of ceramic materials.

SLO 12C.5.2.3: Demonstrate staining, glazing, and firing techniques.

SLO 12C.5.2.4: Demonstrate the polishing and completion of dental restorations.

SLO 12C.5.2.5: Demonstrate the use of refractory dyes for all-ceramic restorations.

SLO 12C.5.2.6: Demonstrate the duplication process of dental models.

Goal 6: Demonstrate the **repair and adjustment** of dental appliances.

GLO 6.1: Demonstrate an awareness of **problems** associated with dental appliances.

SLO 12C.6.1.1: Demonstrate knowledge of limitations associated with ceramic material and its durability.

GLO 6.2: Repair dental appliances.

SLO 12C.6.2.1: Demonstrate knowledge of soldering in a ceramic furnace, using gold solder.

SLO 12C.6.2.2: Demonstrate knowledge of ceramic application to repair or adjust a restoration.

GLO 6.3: Adjust dental appliances.

SLO 12C.6.3.1: Demonstrate knowledge of adjusting ceramic restorations.

Goal 7: Describe and demonstrate transferable **cross-curricular knowledge and skills** as they relate to dental technology.

GLO 7.1: Read, interpret, and communicate information related to dental technology.

SLO 12C.7.1.1: Read, interpret, and communicate information and terminology related to dental technology and ceramics.

GLO 7.2: Apply knowledge and skills related to dental technology from **mathematics**.

SLO 12C.7.2.1: Convert between imperial and metric systems of measurement.

SLO 12C.7.2.2: Calculate and apply volume, weights, measurements, temperatures, and ratios.

GLO 7.3: Apply knowledge and skills related to dental technology from **anatomy and physiology**.

SLO 12C.7.3.1: Locate, identify, and describe anatomical landmarks specific to anterior facial identification, including horizontal growth lines (e.g., perikymata).

GLO 7.4: Apply knowledge and skills related to dental technology from **physics**.

SLO 12C.7.4.1: Demonstrate an awareness of the movement of the mandible in sagittal and horizontal planes.

GLO 7.5: Apply knowledge and skills related to dental technology from **other subject areas** (art, physical education/health education, information and communication technology, social studies).

SLO 12C.7.5.1: Demonstrate an understanding of the psychological factors associated with bruxism (teeth clenching and grinding).

SLO 12C.7.5.2: Read, interpret, and demonstrate an understanding of information about the science of colour and shade taking associated with dental technology.

Goal 8: Demonstrate an understanding of **career opportunities** in dental technology.

GLO 8.1: Describe **education and career opportunities** and **professional organizations** in dental technology and associated fields.

No applicable SLOs.

Goal 9: Demonstrate an awareness of **sustainability** as it pertains to dental technology.

GLO 9.1: Describe the impact of **sustainability** on the **health and well-being** of dental technologists and their clients.

SLO 12C.9.1.1: Discuss the positive influence of dental technology on people's sense of well-being, health, and enjoyment of quality of life.

GLO 9.2: Describe the dental technology industry's **sustainability practices** and their impact on the **environment**.

SLO 12C.9.2.1: Discuss the safe disposal of chemicals and excess materials used in ceramic restorations.

GLO 9.3: Describe **sustainable business practices** within dental technology.

SLO 12C.9.3.1: Discuss new cosmetic products related to ceramic restorations.

Goal 10: Demonstrate an awareness of **ethical and legal standards** as they pertain to dental technology.

GLO 10.1: Practise **ethical and legal standards** as they pertain to dental technology.

SLO 12C.10.1.1: Demonstrate and discuss legislative acts that govern the dental technology profession.

Goal 11: Demonstrate **employability skills** related to dental technology.

GLO 11.1: Demonstrate **fundamental employability skills**.

SLO 12C.11.1.1: Demonstrate the skills required to work as a member of a team.

GLO 11.2: Demonstrate an understanding of the **business operation** of a dental laboratory.

SLO 12C.11.2.1: Discuss and demonstrate stock ordering, equipment maintenance, and business promotion to potential clients.

Goal 12: Demonstrate an understanding of the **evolution** of dental technology, including its **progression** and **emerging trends**.

GLO 12.1: Describe the **evolution** of dental technology, including its **progression** and **emerging trends**.

SLO 12C.12.1.1: Discuss the evolution of dental ceramic technology, including its progression and emerging trends.
