Exit level Outcomes / Standards for Dental Technology: 3-year Diploma, 4-year Degree, and Advanced and Postgraduate Diplomas

Contents

Outcomes in the psychomotor domain

Outcomes in the psychomotor domain require that a variety of different procedures are completed competently. Many of these procedures require different stages to be carried out before the procedure itself is completed. In each year, each University will determine the minimum number of procedures to be completed before continuing to the next year of study. Completed procedures will only be credited to the student once carried out competently without assistance. This means that each stage of a procedure as well as the completed procedure must be assessed objectively, using criteria set out in the form of a rubric. Council will produce the minimum critical criteria only for the completed procedures but not for each stage. For the stages, the Universities are encouraged to work together to develop and use a common set of criteria. The purpose of all rubrics, whether for a stage or a completed procedure, is to allow for the student to use them to first assess their own work, which will then be assessed by the lecturer. If there is agreement, the student will be credited with the stage or the procedure. If there is disagreement, this is regards as a learning opportunity for the student to learn why their application of the criteria differed from that of the lecturer.

The Council minimum critical criteria should be used at all times, and especially in preparing the students for any year or programme exit-level practical examination. In the case of the programme exit level practical examination, if a procedure is deemed competent according to the minimum critical criteria, the University will then have the option of applying additional criteria in order to determine an appropriate passing mark.

Outcome 1: Oral Anatomy: All Diplomas and 4-year Degree

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• Know the nomenclature associated with anatomical descriptions	• Describe anatomical features correctly.
• Know the skeletal structures of the stomatognathic system (orbits, nose, zygomas, maxillae, mandible, styloid, hyoid)	• Identify the skeletal structures of the stomatognathic system
• Know the intra-oral surface anatomy and functions of the structures of the dentate and edentulous mouth	• Identify the structures and functions of the intra-oral anatomy of the dentate and edentulous mouth
• Know the anatomy of the edentulous mouth and understand the patterns of resorption and how this differs between the maxillae and the mandible (relate to Outcome 4, Removable Prosthodontics 1)	• Identify the features of the edentulous mouth and reproduce diagrammatically the patterns of resorption in the edentulous jaws.
• Know the external features of the oral region	• Identify the external features of the oral region
• Know the structures of the temporo-mandibular joint	• Identify the structures of the temporo-mandibular joint
• Know the muscles of mastication, their origins and insertions, and their functions	• Relate the structure and functions of the muscles of mastication
• Understand the border and functional movements of the mandible and how they relate to the teeth and their importance when replacing teeth in an edentulous mouth (relate to Outcome 4, Removable Prosthodontics 1)	• Explain the movements of the mandible and associate these with the dentition and their influence on artificial dentitions
• Know the muscles of facial expression that influence the structure and function of the stomatognathic system	• Relate the functions of the muscles of facial expression that influence the structure and function of the stomatognathic system
• In maxillofacial prosthodontics, know the anatomical features of the eye, nose and ear	• Identify the anatomical features of the eye, nose and ear

Outcome 2: Dental Materials Science: All Diplomas and 4-year Degree

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• Understand the following aspects of each dental material used: • The physical and/or chemical and mechanical properties of the material relative to the basic science of the particular class of material. *Note: This requires that the necessary prior learning has been acquired through the Physics and Chemistry service courses; alternatively that the necessary science will be taught as part of this course, by building on the Science knowledge already acquired by passing the National Senior Certificate at the level stipulated by the entrance requirements.* • The degree of divergence from the ideal properties for the application of the material • The correct manipulation and storage of the material and how properties can be varied by manipulation, both correct and incorrect	• Classify and compare dental materials in terms of their application and suitability for that application, by recalling: o The physical and/or chemical and mechanical properties of the material o How far it may deviate from the ideal o How to manipulate, store and use the material, including where applicable in its set form o The consequences of incorrect manipulation The following materials will be assessed at the most suitable time in the curriculum, to coincide with the first time they will be encountered: • Dental gypsum products in removable and fixed prosthodontics and orthodontics • Gypsum model sealers and polishing agents • Impression materials for complete dentures, orthodontics and partial dentures: impression compound; irreversible hydrocolloid; zinc oxide-eugenol; poly-vinyl siloxanes; single-vinyl A-silicones and other alginate substitutes • Waxes used in the making of removable prostheses including indicator wax and correction wax in removable complete and partial dentures • Artificial tooth materials: porcelain, acrylic, composite • Acrylic resins: autopolymerising and light cured as used for special trays; resins used for denture bases, cured in different ways (heat, micro-wave, autopolymerising); the incorporation of metals and glass and resin fibres into denture base resins; resins and composites used for provisional restorations. • Fluxes and solders • Wrought wires; stainless steel; cobalt-chrome; orthodontic; • Materials used for RPD frameworks: stellite alloys; PEEK; titanium; resins used for milling • Investments and refractory materials: gypsum-bonded; phosphate-bonded; silica-bonded • Impression materials currently used in fixed prosthodontics: polyvinyl siloxanes; polyether; polyvinyl ether silicone; and those used for jaw registration procedures • Waxes used in fixed prosthodontics: inlay waxes, carving waxes, waxes used for jaw registration • Resins used for patterns for casting • Metals used in fixed prosthodontics: precious and semi-precious casting alloys; base metal casting alloys; ceramo-metals; metals used in implant dentistry • Ceramics used in dentistry: feldspathic; leucite; alumina reinforced; low-fusing; metal ceramics; pressable ceramics; lithium disilicate; zirconia; lithium silicate; inter-penetrating network ceramics; sintering • Materials used in stereolithography: resins; metals; ceramics; waxes • **For the degree and Advanced and Postgraduate Diplomas:** Materials used in maxillofacial prosthodontics: heat-cured silicones; soft acrylics; polyamide flexible acrylics; room temperature vulcanising elastomers
• Know and understand the need for and methods of disinfection / sterilisation appropriate to the different materials and appliances	• Describe the most appropriate methods of disinfection / sterilisation of the different materials and appliances as they are encountered

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• Understand all associated aspects of the manipulation of dental materials	To be assessed at the most suitable time in the curriculum, to coincide with the first time they will be encountered: • Discuss the differences between cutting, grinding, abrading and polishing when manipulating acrylic resins • Describe the lost-wax process for casting • Differentiate between cast and wrought metal and the influence on their properties • Discuss the differences between cutting, grinding, abrading and polishing when manipulating metals and ceramics • Discuss the properties of wires and their manipulation: stress vs strain; elastic limit; proportional limit; influence of length and diameter; work hardening; heat treatment • Differentiate between soldering and welding • Discuss the use of casting alloys for partial denture frameworks • Discuss the use of partial denture framework milled and sintered materials • Discuss the principles of beam mechanics and how they apply to fixed partial dentures and implant-supported frameworks • Discuss the physics of casting metals • Describe corrosion and corrosion resistance in dental alloys • Relate methods of describing colour and discuss the application of colour science to shade matching • Describe the following aspects of ceramics: firing, sintering; bonding; etching; glazing; polishing; colouring; thermal expansion; crack propagation; strengthening; tensile vs compressive forces • Relate the procedures used in CAD/CAM: digital impressions; milling; rapid prototyping / stereolithography / 3D printing; laser sintering • **For the degree and Advanced and Postgraduate Diplomas:** Describe the procedures used in maxillofacial prosthodontics for the use and manipulation of heat-cured silicones; soft acrylics; polyamide flexible acrylics; room temperature vulcanising elastomers

Outcome 3: Tooth Morphology. All Diplomas and 4-year Degree

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to the minimal critical criteria (set out in another document) and compare with the lecturer's assessment.
• Know the terminology relating to descriptions of teeth • Know the different numbering systems used internationally	• Identify different aspects of teeth using the correct terminology • Know and apply the American and FDI numbering systems	• Draw the tooth shape and morphology of permanent teeth.	• Correctly draw and label the shape and morphology of all the permanent teeth.
•	•	• Wax up (on preparations) the crowns of a maxillary central and lateral incisor and a canine on one side to match those of the other side of the arch • Wax up (on preparations) the crowns of a mandibular central and lateral incisor and a canine on one side to match those of the other side of the arch	• Correctly wax up the crowns so that they reproduce the anatomy of the existing teeth.
•	•	• Wax up (on preparations) the crowns of a maxillary quadrant (premolar to second molar) on one side to match those of the other side of the arch, and to occlude with the mandibular waxed crowns in the same manner • Wax up (on preparations) the crowns of a mandibular quadrant (premolar to second molar) on one side to match those of the other side of the arch, and to occlude with the maxillary waxed crowns in the same manner	• Correctly wax up the crowns so that they reproduce the anatomy of the existing teeth as well as the occlusion.
• Know the anatomical limitations and differences of artificial teeth used in removable prosthodontics	• Discuss the influence of different anatomical features of artificial teeth	• Know the anatomical features of artificial teeth	• Identify and sort randomised artificial teeth

Outcome 4: Removable Prosthodontics 1 (mucosa-borne complete dentures): 3-year Diploma

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Understand the mucosa borne complete denture treatment procedures (clinical and technical).	• List the steps taken clinically and technically in the making of complete dentures	•	•
• Understand the principles of denture retention, support and stability	• Discuss the principles of denture retention, support and stability • Identify primary and secondary support areas	•	•
• Recognise the anatomical features reproduced in primary Impressions	• Identify the anatomical features in a primary impression.	•	•
• Know the required dimensions of primary casts	• List the ideal dimensions of a primary cast	• Use single and double-pour techniques to make primary casts from a primary impression • Trim the casts to the correct dimensions	• Produce primary casts to the required dimensions
• Understand the reasons for using close-fitting and spaced special trays	• Discuss the reasons for using close-fitting and spaced special trays.	• Make close-fitting and spaced special trays using light-cured as well as auto-polymerising material	• Produce close-fitting and spaced special trays to the required criteria
• Know the required dimensions and limits of secondary casts	• List the ideal dimensions of a secondary cast and its limits	• Use a boxing method to produce secondary casts and trim them to the required dimensions	• Produce secondary casts to the required dimensions
• Understand the objectives of a jaw registration procedure and the need for occlusion rims. • Know the required dimensions for maxillary and mandibular occlusion rims	• Discuss the reasons for a jaw registration procedure • List the ideal dimensions of maxillary and mandibular occlusal rims	• Construct occlusion rims on a wax provisional base (and/or a clear acrylic base) to the required dimensions • Construct maxillary occlusion rims posteriorly with anterior teeth set up to average horizontal and vertical distances from the alveolar ridge.	• Produce complete occlusal rims • Produce maxillary occlusal rims with anterior teeth set up to average values.
• Read about a brief history of articulators • Know the difference between moveable and non-moveable, adjustable and nonadjustable articulators	• List the differences between different articulator types	• Transfer a jaw registration to an average-value articulator including transferring clinical information for verification	• Articulate a jaw registration correctly onto an average-value articulator, reproducing the clinical information on the occlusion rims

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Understand the principles of anterior tooth selection and placement, based on aesthetics and not on dogma • Understand the limitations of anterior tooth placement according to biometric guides • Know the different Angle classifications of anterior tooth relationships and their modification for complete dentures • Know the standard shade guides used in removable prosthodontics	• Evaluate the historical and manufacturer-driven dogmas on artificial tooth selection • Describe a standard method of setting up maxillary anterior teeth • Discuss the limiting factors to maxillary and mandibular anterior tooth placement	• Use the occlusal rims as a guide to setting teeth • Use biometric guides and anatomical limitations to arrange anterior teeth in a Class I arrangement. • Use a shade guide to differentiate between shades of artificial teeth	• Arrange anterior teeth in a Class I arrangement according to the relevant criteria. • Identify the shades of different artificial teeth
• Understand the principles of posterior tooth selection and placement, based on anatomic and biometric guides and the need for stability	• Compare the different methods for establishing the occlusal plane	• Use biometric and anatomical guides to arrange posterior teeth subsequent to the correct placement of anterior teeth	• Arrange posterior teeth at the correct occlusal plane
• Understand the principles of jaw movements and how they relate to cusp angles and their influence on balanced occlusion	• Explain how jaw movements influence the placement of anatomical artificial teeth	• Set up posterior teeth to conform to appropriate compensating curves.	• Arrange posterior teeth in a Class I arrangement according to the correct criteria
• Know the normal appearance of the gingiva in natural teeth • Understand the need for the external contours of complete dentures	• Describe the normal appearance of the gingiva in natural teeth • Discuss the external contours of complete dentures and how they affect stability	• Mimic the normal appearance of the gingiva in natural teeth • Produce the correct external contours when waxing up a trial base after tooth setup	• Create a wax up of the trial base with the correct appearance and contours.

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
•	•	• Invest trial wax dentures in appropriate flasks using a 3-pour technique • Boil out the wax and prepare the flasks for curing • Use the correct ratios to mix the acrylic, pack correctly, using a trial closure, and cure using the prescribed method. • Try to preserve the original casts when divesting / deflasking dentures • Preserve the anatomical features of the teeth, festooning and periphery when trimming and polishing acrylic dentures • Pour new casts using the deflasked dentures • Remount the finished dentures on the original articulator • Achieve bilateral contacts in centric occlusion by adjusting the occlusion	• Master the ability to Invest/flask trial dentures, boil out, pack and cure, divest/deflask, trim and polish, remount, adjust for bilateral centric contacts in conformity to the criteria applied to a finished, clinically ready, set of complete dentures.
• Understand in greater depth the relationships between jaw movements and occlusion in order to develop a balanced occlusion	• Explain why it not possible to provide a fully balanced articulation using anatomical teeth without having to adjust some cusp angles of those teeth.	• Fully balance the occlusion using ~~artificial~~ anatomical teeth for a Class I jaw relationship, on an average value articulator.	• Using an average-value articulator, produce a trial set of complete dentures ready for flasking, in a Class I set up with fully balanced occlusion using anatomical teeth.
• Understand the differences between normal (Class I), retrognathic (Class II) and prognathic (Class III) jaw relationships and how these affect the placement of the teeth	• Explain the need to modify the arch forms and placement of the teeth for retrognathic and prognathic jaw relations	• Set up a balanced occlusion for a retrognathic jaw relationship • Set up a balanced occlusion for a prognathic jaw relationship	• Produce a trial set of complete dentures ready for flasking, in a Class II set up with fully balanced occlusion using anatomical teeth, on an average-value articulator • Produce a trial set of complete dentures ready for flasking, in a Class III set up with fully balanced occlusion using anatomical teeth, on an average-value articulator

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Understand the principles of a balanced lingualised occlusion • Understand the modifications required for a balanced lingualised occlusion for retro- and prognathic jaw relations	• Explain the need to adjust the tooth positions and form for a balanced lingualised occlusion • Explain the need for modifications to obtain a balanced lingualised occlusion for retro- and prognathic jaw relations	• Set up anatomical maxillary teeth and modified non-anatomic mandibular teeth in the correct positions for a balanced lingualised occlusion in a Class I set up • Set up anatomical maxillary teeth and modified non-anatomic mandibular teeth in the correct positions for a balanced lingualised occlusion in a Class II set up • Set up anatomical maxillary teeth and modified non-anatomic mandibular teeth in the correct positions for a balanced lingualised occlusion in a Class III set up	• Produce a finished set of complete dentures in a Class I set up with fully balanced lingualised occlusion using anatomical maxillary teeth and modified non-anatomic teeth, on an average-value articulator. • Produce a trial set of complete dentures ready for flasking, in a Class II set up with fully balanced lingualised occlusion using anatomical maxillary teeth and modified non-anatomic teeth, on an average-value articulator • Produce a trial set of complete dentures ready for flasking, in a Class III set up with fully balanced lingualised occlusion using anatomical maxillary teeth and modified non-anatomic teeth, on an average-value articulator
• Understand the limitations of using commercially available artificial teeth produced for lingualised occlusion	• Discuss the limitations of using commercially available artificial teeth produced for lingualised occlusion	•	•
• Understand the need for modified techniques in the creation of a single complete denture opposing a natural dentition.	• Explain the need for modified techniques in the creation of a single complete denture opposing a natural dentition.	• Create a single maxillary denture opposing a natural dentition	• Produce a finished single maxillary denture opposing a natural dentition
• Understand the aesthetic limitations of denture base resins and know the ways in which these can be overcome.	• Discuss the aesthetic limitations of denture base resins and list the ways in which these can be overcome	• Develop stippling and colour characterisations of a maxillary complete denture	• Create stippling and colour characterisations of a maxillary complete denture (this could be done during the production of a maxillary single denture)
• Know the different methods that have been used historically for producing immediate replacement prostheses.	• Describe the methods used in the past and present for producing immediate replacement prostheses	•	•
• Understand the necessity for providing an anterior flange for immediate dentures and the disadvantages of so-called “socketing”	• List the advantages and disadvantages of the provision of an anterior flange for immediate replacement prostheses.	•	•
• Know the reasons for trimming a dentate model to convert it for an immediate replacement denture.	• Discuss the advantages of trimming a dentate model when converting it to receive an immediate replacement denture.	• Follow the correct procedure for trimming a dentate model to convert it to receive an immediate replacement denture	• Correctly perform the procedure for trimming a dentate model to convert it to receive an immediate replacement denture

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Know the advantages of providing a surgical stent to guide the extractions of the teeth and the modifications of the sockets (alveoplasty) when the dentist fits an immediate replacement denture.	• List the advantages of using a surgical stent for immediate replacement dentures.	• Make a clear acrylic surgical stent or use a vacuum formed polycarbonate material after model trimming for immediate replacement dentures	• Correctly create a clear acrylic surgical stent or a polycarbonate stent for a maxillary immediate replacement denture
•	•	• Create a set of immediate replacement complete dentures where both maxillary and mandibular extractions are required	• Construct a set of immediate replacement compete dentures to the required criteria
• Know the advantages and disadvantages of different curing methods used for complete dentures	• List the advantages and disadvantages of different curing methods for complete dentures such as heat-cured, rapid heat-cured, autopolymerising, micro-wave cured and the use of injection moulding, pour techniques, etc.	• Use different flasking methods and curing techniques during the course of the programme	• Use at least two different methods of flasking and curing during the course of the programme
• Know the common types of repair required for complete dentures and their most probable cause(s)	• List the common types of repair required for complete dentures and describe their most probable cause(s)	• Replace a missing tooth on a complete denture • Replace a flange on a complete denture • Repair a mid-line fracture of a maxillary complete denture	• Cary out repairs on complete dentures to replace a tooth, replace a flange, and repair a maxillary mid-line fracture to the required criteria.
• Understand the different types of reline procedure and the reasons for using different materials	• Discuss the use of conventional impression materials as well as functional impression materials for reline procedures	• Reline a maxillary complete denture from in impression using conventional impression materials. • Reline a mandibular complete denture using a silicone-based heat-cured reline material	• Correctly reline a maxillary complete denture using heat-cured acrylic resin • Correctly reline a mandibular complete denture using a silicone-based heat-cured reline material
• Know the difference between relining and rebasing for complete dentures	• List the differences between relining and rebasing in complete dentures	• Rebase a mandibular complete denture	• Correctly rebase a mandibular complete denture with the correct external contours.
• Know different methods for duplicating complete dentures, including the clinical aspects	• Relate a method for duplicating complete dentures	• Duplicate a set of complete dentures	• Correctly carry out the procedures for duplication of complete dentures.

Outcome 5: Removable Prosthodontics 2 (overdentures): Additional outcomes for the 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Know the methods used to protect and enhance retention for remaining teeth to be used to help support an overdenture.	• Describe the use of copings and attachments for tooth-supported overdentures.	•	•
• Understand the use of single, double and multiple implants and attachments to support an overdenture	• Discuss the use of implants to support an overdenture and the attachments used (ball, bar, bar-and-clip)	• Make an overdenture incorporating matrix attachments for a two-implant supported overdenture using ball attachments	• Master the procedures required to incorporate matrices for ball attachments
•	•	• Make an overdenture incorporating clips for a two-implant supported overdenture using a connecting bar	• Master the procedures required to incorporate clips for a connecting bar

Outcome 6: Removable Prosthodontics 3 (removable partial dentures): 3-year Diploma

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Know what changes in form and function in the mouth result from partial tooth loss	• Explain the biological consequences of partial tooth loss	• Make primary casts from an impression or mould for a partially dentate patient whilst maintaining the integrity of the teeth	• Produce an intact cast of a partially dentate mouth to the required criteria
• Understand the biological and ecological effects of removable partial dentures on the remaining structures of the mouth	• Discuss the effects a removable partial denture can have on the remaining structures of the mouth	•	•
• Know the Kennedy classification of edentulous spaces in partially dentate patients	• Classify casts or diagrams of partially dentate patients	• Construct wax bases suitable for jaw registration for a variety of different partially dentate situations	• Produce wax bases with occlusal rims for different Kennedy classifications of partial dentitions
• Understand the biomechanical basis of support and the differences between the reaction of teeth and soft tissues to load	• Indicate the reasons for the differences in reaction between teeth and mucosa when subjected to occlusal forces	•	•
• Know the different types of retention in removable partial dentures	• Describe the guide-plane, active (clasp) and indirect retention	•	•
• Understand how guide plane retention is achieved	• Discuss the benefits of guide plane retention	•	•
• Understand how retention is achieved through the use of clasps and the need for reciprocation	• Discuss and explain active (clasp) retention and reciprocation	•	•
• Understand the principles of indirect retention and how it is achieved to minimise rotational forces	• Discuss the effect of rotation on retention and how indirect retention can minimise this	•	•
• Know how support is obtained in acrylic based removable partial dentures	• Describe cingulum and occlusal rests in acrylic based removable partial dentures	•	•
• Know the different components and parts of framework-based removable partial dentures and their function	• Identify the different components and parts of framework-based removable partial dentures and describe the function of each	•	•
•	•	• Construct a spaced special tray with appropriate stops and with retention that is appropriate to the final impression material to be used	• Produce spaced special- trays with perforations appropriate for the final impression material

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Know the component parts of a surveyor and their function	• Identify the component parts of a surveyor and describe their function	• Use a surveyor to position the cast, produce survey lines, measure undercuts, and make locating marks for repositioning	• Survey partially dentate maxillary and mandibular master casts to the required criteria
•	•	• Block out undercuts appropriately for an acrylic- and framework-based removable partial denture	• Using appropriate block-out wax, block out undercuts on casts of different partially dentate cases to the required criteria
• Know the different methods for duplicating a cast	• List the different methods of duplicating a cast	• Use reversible hydrocolloid impression material to duplicate a final master cast	• Duplicate a master cast in Type IV dental stone to the required criteria
•	•	• Mount casts on an average-value articulator using a jaw registration record	• Mount the casts correctly and neatly to the required criteria on an average-value articulator
• Understand the principles of design for the different Kennedy classifications	• Produce designs appropriate to different patterns of partial tooth loss	• Adapt round wire as clasps for an acrylic-based partial denture	• Make clasps for different teeth using stainless steel round wire of 1.0 mm diameter
•	•	• Adapt half-round wire to fit into prepared occlusal rest seats	• Make occlusal rests for premolar and molar teeth using half-round stainless steel wire
•	•	• Invest trial wax dentures in appropriate flasks using the appropriate technique • Boil out the wax and prepare the flasks for curing • Use the correct ratios to mix the acrylic, pack correctly, using a trial closure, and cure using the prescribed method. • Preserve the anatomical features and periphery when trimming and polishing and without disturbing the metal components • Fit onto the duplicate cast, trimming the cast as necessary to fit over the edentulous areas • Remount and adjust the occlusion	• Master the ability to Invest/flask trial acrylic-based partial dentures, boil out, pack and cure, divest/de-flask, trim and polish, seat onto the duplicate cast, adjust for bilateral centric contacts in conformity to the criteria applied to finished, clinically ready, partial dentures.
•	•	• Use reversible hydrocolloid impression material to duplicate a final master cast in refractory investment material and prepare the cast for waxing	• Duplicate a master cast in refractory investment material and prepare the cast correctly
•	•	• Mount the casts on an average-value articulator using a jaw registration record	• Mount the casts correctly and neatly on an average-value articulator
•	•	• Carry out a full wax up for a framework-based partial denture using the appropriate waxes and patterns	• Master the ability to produce a wax up to a given design for a framework-based partial denture

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
•	•	• Apply the correct sprues and reservoirs to the wax pattern ready for casting. • Invest the refractory cast, burn out, and cast in Co/Cr using the appropriate casting machine. • De-vest, clean, trim and polish and fit onto the master cast.	• Master the ability to invest, burn out, cast, de-vest and finish metal frameworks for different designs of framework-based partial dentures ready for the next clinical visit
•	•	• Add a wrought wire stainless steel 1.0 mm round wire clasp to the framework by adapting it to a premolar tooth and soldering onto the metal framework. • Adapt and add a wrought wire clasp by welding it to a cast framework.	• Use the correct technique to adapt a wrought wire to a tooth and solder it to the metal framework • Use the correct technique to adapt a wrought wire to a tooth and weld it to the metal framework
•	•	• Wax up the edentulous areas for a try-in • Flask, boil out, de-flask and finish the edentulous areas.	• Master the ability to wax up and finish the edentulous area to the required criteria.
• Know the theory behind the use of the altered cast technique for impressions and for relines	• Relate the theory of the altered cast technique to reduce the differential loading characteristics of teeth and mucosa	• Modify the cast to receive an altered cast impression or a reline and pour the final cast	• Perform the actions required to create an altered cast and to pour the cast from an impression of the distal extension base area

Outcome 7: Removable Prosthodontics 4 (advanced removable partial dentures): Additional outcomes for the 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Know the processes and procedures to create digital impressions of partial dentitions, and the digital pathways to design, print, mill, sinter framework-based partial dentures	• Describe the different digital pathways to create a framework-based partial denture	• Create a digital file by scanning an impression or a cast • Design and create a digital framework ready for processing • Mill a framework from a polymethyl methacrylate block • Use 3D printing to print a resin framework	• Perform all the activities and processes to digitally create a framework for a partial denture that can be either milled, printed or sintered.
• Know which precision attachments can be used to enhance the retention of framework-based partial dentures	• Describe the most commonly used precision attachments for framework-based partial dentures.	• Create a metal framework incorporating a precision attachment	• Perform all the activities and processes to produce a metal framework incorporating at least one precision attachment.
• Understand the clinical situations where milled crowns provide retention where the anatomy of the crown is completed by the metal framework.	• Discuss the situations when milled crowns are likely to be used.	• Design and provide a metal framework that fits and completes milled crowns as precisely as possible.	• Perform all the activities and processes to produce a metal framework to complete the anatomy of milled crowns
• Understand the clinical situations where it may be necessary to make a metal framework which provides anterior palatal backings.	• Discuss the situations when anterior palatal backings may be required.	• Design and provide a metal framework with anterior palatal backings	• Perform all the activities and processes to produce a metal framework with anterior palatal backings
• Know the clinical situations were a mandibular swing-lock mechanism may be required.	• Describe the situations where a swing-lock framework-based partial denture may be required	•	•
• Understand the clinical situations in patients requiring maxillofacial prostheses where a metal framework substructure is required.	• Discuss the situations where a metal substructure might be needed for a patient requiring maxillofacial prosthodontics.	•	•

7Outcome 8: Fixed Prosthodontics 1: 3-year Diploma

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Know the procedures and reasons for creating and using sectional models in fixed prosthodontics	• Relate the reasons and practices for using sectional models in fixed prosthodontics	• Pour a model from an impression or mould using vacuum-mixed Type IV stone • Section the model, pin and base	• Produce a model for fixed prosthodontics without air bubbles or blemishes • Section, pin and base models correctly
• Understand the principles and features of tooth preparations for inlay, onlays, and crowns and the appropriate margins.	• Describe the different margins used for tooth preparations in fixed prosthodontics	• Ditch dies to reveal the margins of tooth preparations in fixed prosthodontics	• Carry out ditching procedures without interfering with the preparation margins for a variety of different preparations
• Know the reasons for providing spacing in dies for cast restorations	• Give the reasons for the use of die spacers	• Apply die hardener and spacer where required	• Follow the correct procedure to apply die spacer
• Know the different methods used to record a jaw registration in dentate patients	• Recognise the different methods and materials used to record a jaw registration in fixed prosthodontics	•	•
• Revise jaw movement, mastication and occlusal relationships in the natural dentition • Understand tooth contacts in static and excursive movements of the mandible	• Describe the movements of the mandible and how they affect tooth contacts in protrusive and lateral movements	•	•
• Know the differences between an average-value articulator and a semi-adjustable articulator and their relationship to mandibular movements	• Discuss what adjustments can be made on a semi-adjustable articulator in terms of the mandibular movements	•	•
• Understand the purpose of a face bow to transfer the spacial relationship of the maxillae to the skull • Know the different methods and materials used to record a centric jaw relationship	• Describe how a face bow is used to transfer information to the articulator • List the different methods and materials used in recording a centric relationship	• Use a face bow to mount a maxillary cast on a semi-adjustable articulator • Use a centric jaw registration to mount the mandibular cast	• Mount a maxillary cast on a semi-adjustable articulator correctly using a face-bow, and assess according to the required criteria • Mount the mandibular model neatly and correctly using a jaw registration

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Understand the limitations of using protrusive and lateral jaw registrations to adjust the settings of a semi-adjustable articulator • Understand the use of dentate casts to adjust the settings of a semi-adjustable articulator	• Discuss the different methods used to adjust the settings of a semi-adjustable articulator	• Use wax protrusive and lateral jaw registrations to adjust the incisal and condylar settings on a semi-adjustable articulator • Adjust the settings of a semi-adjustable articulator by manipulating the dentate casts	• Adjust the settings of a semi-adjustable articulator using wax registrations and compare the student's settings with those of the instructor using the same registrations • Adjust the settings of a semi-adjustable articulator by manipulation of the dentate casts and compare the student's settings with those of the instructor
• Understand the limitations of straight line setting of an incisal table and the advantages of reproducing the natural curvatures of the teeth in protrusive and lateral excursions	• Discuss the limitations of incisal guidance when using a standard incisal guide table.	• Reproduce the natural contours of the anterior teeth in mandibular movements by creating a custom incisal guide table.	• Master the procedure to produce a custom incisal guide table to the required criteria
•	•	• Wax, sprue, cast and finish inlay(s), onlay(s) and full metal crown(s), using appropriately prepared models.	• Produce inlay(s), onlay(s) and full metal crown(s) to the required criteria.
• Revise the principles of aesthetics in the natural dentition and the limitations of dogmas when applied to aesthetics	• Discuss the principles of aesthetics in the natural dentition and the limitations and evidence (if any) of Digital Smile Design	• Using appropriate wax(es), revise the dentition by carrying out a diagnostic wax-up	• Produce a diagnostic wax up to the criteria specified
• Know the principles of tooth preparations for anterior and posterior ceramo-metal crowns.	• Relate the expected preparation reduction, shape and marginal configurations for preparations for anterior and posterior ceramo-metal crowns.	• Wax, cast and finish metal copings for an anterior and posterior ceramo-metal crown • Apply and finish ceramic to a coping for an anterior ceramo-metal crown to the correct dimensions and tooth shade, using a ceramic labial butt-joint and incorporating intrinsic characterisation.	• Produce copings for anterior and posterior ceramo-metal crowns to the required criteria. • Produce a finished anterior ceramo-metal crown with a labial ceramic shoulder (or deep chamfer) and incorporating intrinsic characterisation to the required criteria.
• Know the principles of a tooth preparation for an anterior and posterior all ceramic crown	• Relate the expected preparation reduction, shape and marginal configurations for anterior and posterior all ceramic crowns	•	•
• Know the principles of a tooth preparation for a post and core preparation for different crowns	• Relate the requirements for an anterior post and core preparation for different crowns	• Construct a pattern using wax and/or inlay resin, sprue, cast and finish, for a post and core for an anterior ceramo-metal crown. • Construct a pattern using wax and/or inlay resin, sprue, cast and finish, for a post and core for a posterior ceramo-metal crown.	• Produce a finished post and core for an anterior ceramo-metal crown to the required criteria. • Produce a finished post and core for a posterior ceramo-metal crown to the required criteria.

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Know the principles of beam mechanics as applied to a fixed partial denture (bridge) and the implications for design.	• Discuss the design features of fixed partial dentures (bridges) relative to size, shape and material, and the respective dimensions of the connecting elements	•	•
• Know the different types of pontic design and their application	• Relate pontic designs to clinical requirements	• Make a 3-unit fixed-fixed all metal fixed partial denture with a modified ridge-lap pontic	• Produce a 3-unit fixed-fixed all metal fixed partial denture with a modified ridge-lap pontic to the required criteria
• Know the principles of a tooth preparation for anterior laminate ceramic veneers	• Relate the expected preparation reduction, shape and marginal configurations for anterior ceramic veneers	• Use suitable ceramics to build up, fire and polish anterior laminate veneers	• Produce anterior laminate veneers to the required criteria
• Know the different systems available locally and internationally in the field of digital dentistry	• Describe the locally available CAD/CAM systems and their differences	•	•
• Understand the workflow of digitally designed and produced ceramic restorations, and the limitations of milling and their effect on preparation design	• Describe the different workflow possibilities in computer-aided design and computer-aided manufacture (CAD/CAM) of restorations and discuss the preparation features needed to conform to the limitations of milling in ceramic restorations.	• Prepare and scan a model from an impression, with preparations for an anterior and a posterior all ceramic crown • Use the digital file from an intra-oral scan or from a scanned model or impression to design the crowns • Save the design and send to a milling machine to mill the monolithic crowns • Retrieve the crowns, polish and return to the die.	• Produce milled anterior and posterior monolithic all ceramic crowns to the required criteria.
• Know the different methods of producing laboratory made provisional restorations	• Relate the different methods of producing laboratory made provisional restorations	• Make provisional restorations using different materials and methods	• Produce laboratory made provisional restorations using the recommended procedures to the required criteria

Outcome 9: Fixed Prosthodontics 2: Additional outcomes for the 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Know the reasons for the use of interocclusal appliances	• Discuss the use of interocclusal appliances, in particular the "Michigan splint"	• Construct a maxillary clear acrylic interocclusal appliance, incorporating canine guides and with contacts only on the mandibular buccal cusps	• Produce an interocclusal appliance to the correct criteria
• Understand the limitations of fixed-fixed bridges in the mandible and the need for a moveable joint	• Discuss the need for a fixed-moveable bridge in the mandible	• Construct a 3-unit ceramo-metal fixed partial denture for mandibular preparations using a semi-precision moveable joint	• Produce a 3-unit fixed-moveable ceramo-metal fixed partial denture to the required criteria
•	•	• Use CAD/CAM procedures to produce a ceramic core for a veneered ceramic anterior crown with internal characterisation	• Master the procedures for a digitally produced ceramic core and to create a veneered ceramic crown to the required criteria
•	•	• Use a digital workflow to mill, polish, and fit to their dies, anterior ceramic veneers.	• Produce anterior ceramic veneers using CAD/CAM to the required criteria.
• Know how milled crowns provide retention, support and stability to a metal-based removable partial denture • Know the requirements for the tooth preparation to receive a milled crown	• Describe the use of milled crowns in conjunction with a metal-based removable partial denture. • Relate the preparation requirements and margins for milled crown restoration	• Use an appropriately prepared partially dentate model to make one or more anterior milled ceramo-metal crowns and a posterior milled full metal crown to be completed by a metal-based removable partial denture (see Outcome 7).	• Create to completion milled anterior ceramo-metal crowns and a milled posterior full metal crown, and produce a metal framework-based partial denture to a design that incorporates the milled crowns (see Outcome 7), all to the required criteria.
• Know the different and most commonly used (in South Africa) precision attachments and their mode of action.	• Relate the mode of action of the most commonly used precision attachments.	• Use an appropriately prepared partially dentate model to make crown(s) with an extra coronal precision attachment, and the associated framework-based partial denture.	• Create to completion crown(s) with an extra coronal attachment, and produce a metal framework-based partial denture to a design that incorporates the precision attachment.
•	•	• Use wax and/or inlay resin to make a post and ball attachment casting to finish, to act as an abutment for a tooth-supported overdenture (see Outcome 5).	• Produce a post-retained ball abutment which is appropriate for a tooth-supported overdenture (see Outcome 5).

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Know the differences between implants that receive a screw-retained as opposed to a cement-retained restoration	• Relate the differences between screw-retained and cement-retained implant restorations	• Make a screw-retained ceramic crown for a single implant • Make a cement-retained ceramic crown for a single implant	• Produce a screw-retained anterior ceramic crown to the required criteria • Produce a cement-retained posterior ceramic crown to the required criteria
• Know the different implant abutments and methods used to correct the angulation of the restoration and their limitations.	• Relate the different abutments commonly available to correct the angulation of the restoration	• Design a custom-made abutment for an anterior implant fixture using computer-aided design.	• Create a design for a custom abutment for an anterior implant fixture to the required criteria.
• Understand the requirements for implant superstructures that will support a fixed implant-supported prosthesis and a removable overdenture.	• Discuss the implant superstructures that can be created for implant supported full-arch prostheses	• Design, cast and fit a superstructure for a 5-implant-retained overdenture • Design, cast and fit a superstructure for a 5--implant retained superstructure for a fixed prosthesis • Make to finish, the definitive implant-retained fixed prosthesis.	• Produce a 5-implant retained superstructure for an overdenture to the required criteria • Produce a 5-implant retained superstructure for a fixed prosthesis to the required criteria • Produce a fixed prosthesis supported by the superstructure to the required criteria
• Be aware of the advances in digital technology and the use of virtual diagnostics, planning, and design.	• Be responsive to the advances in digital technology	•	•

Outcome 10: Orthodontics 1: 3-year Diploma

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Know the rationale behind and the dimensions for the production of orthodontic study models and working models • Know the rationale for stone reduction to accommodate components	• Relate the reasons for producing orthodontic study and working models to the correct dimensions • Know the reasons for stone reduction to accommodate components	• Be able to pour and trim orthodontic study models • Be able to pour and trim orthodontic working models with reduction to accommodate components	• Produce orthodontic study models to the required criteria • Produce orthodontic working models to the required criteria
• Know the primary dentition, and its nomenclature in the different tooth numbering systems	• Recognise the primary dentition and apply the FDI numbering system	•	•
• Understand the mixed dentition and its transition to the permanent dentition	• Recognise the mixed dentition and describe the eruption patterns	•	•
• Know the requirement for the articulation of orthodontic models including plaster-less articulation	• Relate the requirement for the articulation of orthodontic models including plaster-less articulation	•	•
• Know the factors to consider in designing the acrylic baseplate for maximum strength, support, comfort and oral structure maintenance during treatment.	• Relate the factors to consider in designing the acrylic baseplate	• Make suitable acrylic baseplates for appliances that will incorporate different components as constructed in the following procedures, including curing, trimming and polishing	• When applicable, master the making of acrylic baseplates where necessary for appliances incorporating a variety of different components, to the required criteria
• Understand the principles of retention in orthodontic appliances.	• Describe the principles and different methods of retention in orthodontic appliances.	• Make Adams cribs, modified Adams cribs, ball clasps, arrowhead cribs, triangular cribs	• Produce a variety of correctly formed retentive cribs and clasps used in orthodontic appliances to the required criteria
• Understand the rationale behind dental arch expansion/correction. • Know the requirement for the design of a variety of expansion /correction components • Understand the clinical and technical considerations in selecting a specific component	• Discuss the need for arch expansion • Relate the design requirements for components used in arch expansion / correction • Describe the factors influencing the selection of components for arch expansion / correction	• Make arch expansion/correction appliances (both maxillary and mandibular) incorporating a variety of components including but not limited to coffin springs, prefabricated expansion screws and devices	• Produce expansion / correction appliances with a suitable variety of components to the required criteria

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Understand the principles of anchorage • Know the principles, design and selection of different components used in anchorage	• Discuss the principles of anchorage in orthodontic appliances • Describe the different components used in anchorage, and their selection	• Construct labial, buccal and lingual bows of a variety of designs and anchorage	• Produce labial, buccal and lingual bows of a variety of designs and anchorage to the required criteria
• Understand the principles of tooth movement • Know the different methods of producing tooth movement with a variety of different components	• Discuss the principles of tooth movement • Describe the different components used to produce tooth movement	• Incorporate a variety of components used to produce orthodontic tooth movement	• Produce an appliance or appliances that incorporate a variety of components used to produce orthodontic tooth movement, to the required criteria
• Understand the rationale behind the inclusion of a variety of bite planes in orthodontic appliances and the consequences of incorrect design	• Discuss the use of the incorporation of bite planes in orthodontic appliances	• Incorporate bite planes into the acrylic baseplate of suitable orthodontic appliances	• Produce appliances that incorporate bite planes to the required criteria
•	•	• Solder and weld appropriate components to an orthodontic appliance	• Use the correct technique to solder and weld components
• Understand the rationale and importance of the use of space maintainers in the mixed dentition	• Discuss the need for space maintainers	• Construct a space maintainer	• Produce a space maintainer to the required criteria
• Know the different types of mouth guards and their rationale	• Relate the need for, and different types of mouth guard	• Use thermoplastic resin to produce a mouth guard	• Produce a mouth guard using thermoplastic resin to the required criteria.
•	•	• Repair and modify a variety of different orthodontic appliances	• Produce appropriate repairs and modifications to a variety of different appliances

Outcome 11: Orthodontics 2: Additional outcomes for the 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
• Understand the rationale for the use of habit correctors and know the different types of appliance used	• Describe the different habit corrector appliances and their use	• Construct a habit correction appliance	• Produce a habit correction appliance to the required criteria
• Understand the theory and rationale behind the use of functional appliances, their advantages and disadvantages. • Understand the principles to be observed in the design and technical execution of the different types of functional appliance.	• Discuss all aspects of the design, principles, use and construction of functional appliances.	• Construct a variety of different functional appliances, including but not limited to: o Bionator (Standard (1), open bite (2) and reversed (3) types) o Twin Block (including a variety of appropriate variations) o Transverse o Quad-helix o Schwartz appliance	• Produce a variety of functional appliances to the required criteria.

Outcome 12: Maxillofacial Prosthodontics: 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
			Note: at the completion of each item of work, the student must self-assess the work according to detailed criteria (set out in another document) and compare with the lecturer's assessment.
Note: It is recognised that it will not be possible to produce all the different prostheses required in the field of maxillofacial prosthodontics and that there may be different levels of expertise in the different Universities. Universities are therefore encouraged to work collaboratively to agree to a minimum set of procedures, and to use guest lecturers from both dental technology and from the specialty of prosthodontics. Ideally, there would be work carried out for patients, but if not, then sample models and casts must be created with the assistance of clinicians and shared amongst the Universities. Universities are further encouraged to create a postgraduate certificate course in maxillofacial prosthodontics.			
• Revise the anatomy of the face and mouth relevant to the field of maxillofacial prosthodontics • Know the different defects which may be encountered and the possible solutions • Know how different impressions are made of maxillofacial defects	• Describe the different defects which are common in the field of maxillofacial prosthodontics • Identify different landmarks and anatomy from a variety of sectional impressions made of maxillofacial defects	• Pour casts appropriate to the different maxillofacial defects • Pour a facial moulage impression	• Produce examples of casts to be used in maxillofacial prosthodontics
• Be aware of the problems associated with snoring and sleep apnoea and possible solutions	• List the different appliances / devices used in sleep apnoea	• Make the main devices used in sleep apnoea: tongue retaining devices and mandibular advancement devices	• Produce an adjustable mandibular advancement device to the required criteria
• Understand the need for surgical stents for maxillectomies and mandibulectomies	• Discuss the use of surgical stents for surgery in the orofacial region	• Make surgical obturators for a dentate and edentulous maxillectomy and mandibulectomy	• Master the procedures to make surgical obturators in maxillofacial prosthodontics
•	•	• Make the final definitive obturators for a maxillectomy using solid and hollow obturators with and without resilient covering / rims	• Master the procedures to produce different obturators for maxillectomies
• Be aware of the problems associated with infants born with cleft lip and palate and some prosthodontic solutions	• Relate the need for assistive devices to aid feeding in cleft lip and palate cases	• Make an assistive prosthesis to aid in feeding for a cleft lip and palate case • Make a nasal stent for a cleft lip and palate case	• Produce a feeding device for a cleft lip and palate patient • Produce a nasal stent for a cleft lip and palate patient
• Know the problems and solutions for soft palate defects and deficiencies	• Relate the possible solutions for soft palate defects and deficiencies	• Make a pharyngeal obturator • Make a palatal lift device	• Master the procedures required to produce a pharyngeal obturator and a palatal lift device
• Be aware of the need for, and problems with head and neck radiotherapy	• Relate the types of radiotherapy used in the treatment of head and neck cancers	• Produce shielding and/or positioning stents and/or tissue retraction devices for patients undergoing radiotherapy	• Make an example of a shielding stent for radiotherapy

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive	Learning Objective / Specified Outcome / Standard: Psychomotor Domain: acquire the ability to carry out the following procedures	Assessment Criteria: Psychomotor
• Revise the anatomy of the orbit, nose and ear	• Know the anatomical features of the orbit, nose and ear	• Carve in wax auricular, nasal and orbital prostheses • Use maxillofacial flasks to flask facial prostheses using a 3-piece technique where appropriate • Cure facial silicone and intrinsic and extrinsic colouration	• Master the procedures for creating, flasking, packing, and colouring auricular nasal and orbital prostheses.
•	•	• Make an ocular prosthesis with a hand-painted iris	• Produce an ocular prosthesis with a hand-painted iris
• Understand the limitations of the analogue production of maxillofacial prostheses and know what can be achieved by digital design and manufacturing	• Discuss the advantages and disadvantages of analogue and digital production of maxillofacial prostheses	• Work with clinicians to plan the rehabilitation of a maxillofacial case using 3D software, printing, casting, milling for frameworks to support a definitive prosthesis	• Assist in the design and creation of the necessary virtual and real artefacts to fully rehabilitate a case using digital technologies.

Outcome 13: Dental technology related legislation and bioethics 1: 3-year Diploma

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• Understand and recognise the common terms used in bioethics, law and human rights.	• Recognise ethical, legal and human rights problems in the health care context.
• Understand the ethical theories and principles, health-related laws, professional ethical guidelines, citizenship and human rights.	• Describe the principles of ethical theories, professional ethical guidelines, citizenship and human rights
• Understand the principles and concepts of professionalism	• Relate the meaning of professionalism as it applies to the dental technology profession
• Understand the regulatory functions of the South African Dental Technicians Council	• Describe the regulatory functions of the South African Dental Technicians Council
• Know the current Dental Technicians Act and its Regulations	• Respond to issues that may arise from the Dental Technicians Act and its Regulations
• Understand the principles of the South African Constitution	• Discuss how a national constitution can affect professional and personal life
• Know the labour legislation as it applies to an employee	• Relate those aspects of labour legislation that impact on an employee in the dental technology profession.

Outcome 13: Dental technology related legislation and bioethics 2: Additional outcomes for the 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• Understand the regulatory requirements for establishing and maintaining a dental laboratory	• Know the requirements of the South African Dental Technicians Council for the regulation of dental laboratories.
• Understand the labour legislation relevant to owning a laboratory and as an employer	• Know the legislation relevant to owing a laboratory and as an employer
•	•

Outcome 14. Dental laboratory management: 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• Understand the principles of business management	• Know the general principles of business management as they apply to the ownership and running of a dental laboratory
• Know how to conduct a strategic business planning exercise and to construct a business plan	• Relate the actions required in strategic planning, and formulate a mock business plan
• Know the different forms of ownership of a dental laboratory	• Relate the different forms of ownership of a dental laboratory
• Understand the principles of accounting as they apply to a dental laboratory	• Describe accounting principles and apply them to examples
• Know those aspects of financial planning that relate to the ownership and functions of a dental laboratory.	• Discuss the financial aspects of running a dental laboratory
• Understand the principles of human resource management	• Describe the concepts and principles for all aspects of human relations as an employer.

Outcome 15. Research methods and techniques: 4-year Degree and Advanced and Postgraduate Diplomas

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• Know how to conduct a literature search for a particular topic and limit it to relevant literature	• Produce a completed literature search to the criteria given
• Understand the principles of evaluating a paper to identify its strengths and weaknesses	• Produce a critique of a given journal paper
• Know the different referencing systems in use, in particular the modern Harvard and Vancouver systems. • Be aware of the different reference manager systems available and their limitations	• Use a prescribed referencing system in assignments and in the following literature review
• Know how to conduct a limited literature review of a given topic using only recent literature, and understand the disadvantages of only using recent literature	• Produce a brief literature review of recent literature on a given topic and identify historical literature that would improve the review
• Understand the different types of study designs generally used in dental technology research papers	• Describe the different types of study designs generally used in dental technology research papers
• Understand the different types of data, qualitative vs quantitative, and the distribution of quantitative data and the implication for analysis	• Discuss the distribution of quantitative data and the need for parametric and non-parametric analyses
• Know how to manipulate simple sets of data (normative and ordinal) to produce descriptive statistics	• Use data sets to produce the mean, standard deviation, frequency distribution, mode, median, interquartile range
• Understand the basics of comparison of data sets: probability, confidence intervals, effect sizes for normally distributed data, and rank correlation for non-parametric data	• Apply the correct analyses according to the distribution of the data to compare two sets of differently distributed data.
• Know the structure of a research proposal as a protocol for a project	• Work in small groups to devise a research project and produce a structured protocol
• Work in small groups to carry out a research project that involves the gathering of data, the production of descriptive statistics and if applicable a simple comparison between groups.	• Work in small groups to produce a poster summarising the project and its results.

Outcome 16: The operation, care, cleaning, maintenance and use of all equipment used in dental technology: All Diplomas and 4-year Degree

Note: These outcomes will apply every time the student encounters a new piece of equipment, but would best serve and be specified in the programme guide.

Learning Objective / Specified Outcome / Standard: Cognitive Domain	Assessment Criteria: Cognitive
• For every piece of equipment encountered: o Know how to operate it within the health and safety aspects o Know the advantages and disadvantages of the equipment o Know what the maintenance and cleaning requirements are	• For every piece of equipment encountered: o Demonstrate how to operate it within the health and safety aspects o Relate the advantages and disadvantages of the equipment o Describe the maintenance and cleaning requirements
• For all the instrumentation encountered: o Know how to use the instrument correctly and safely o Know the advantages and disadvantages of the instrument o Know what the maintenance and cleaning / disinfection requirements are	• For all the instrumentation encountered: o Demonstrate how to use the instrument correctly and safely o Relate the advantages and disadvantages of the instrument o Relate the maintenance and cleaning / disinfection requirements

Outcome 17: Work Integrated Learning

This is a credit-bearing course which will conform to the Work Integrated Learning Policy of the Council.

The work carried out will be assessed according the criteria set out in the policy document and will contribute to the quota of work required to be done prior to entry to the final exit-level practical examination.