BACHELOR OF DENTAL SURGERY PROGRAMME

Semester 3

Faculty of Dental Sciences
University of Peradeniya

Bachelor of Dental Surgery Programme

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2024

CONTENTS

INTRODUCTION

The Bachelor of Dental Surgery (B.D.S) is a five-year study programme, followed by a year of compulsory internship that will qualify you to practice dentistry in Sri Lanka. The training is geared towards transforming you to a dental surgeon who is fully competent to engage in evidence-based dental practice with an emphasis on prevention and early detection of dental diseases. The teaching activities comprise lectures, discussions, tutorial classes, in class assignments, laboratory work, clinical work as relevant to the discipline.

The study program is conducted entirely in English. While the intensive program is mostly intended to ensure that you reach a minimum level of competency required to follow classes in English medium, further training in English will continue throughout the first two semesters to help you improve your English language proficiency.

The first two semesters of the academic program consist of 13 courses. These courses impart knowledge and skills in biomedical sciences as a foundation for the study of clinical dentistry. In the first semester, there is a non-GPA course that will introduce you to the dental profession and common oral diseases and conditions.

The third semester consists of five courses namely Oral Biology, Tooth Morphology and Occlusion, Introduction to Clinical Sciences - I, Introduction to Clinical Sciences – II, and Dental Biomaterials. The two courses on Introduction to Clinical Sciences focus on fundamental mechanisms and the general principles of diseases affecting the human body.

Fourth semester consists of two courses namely Human Diseases 3 and 4 which will enable you to study common human diseases further, especially those that have a bearing

on dental diseases and their treatment. In addition, a basic introduction to clinical skills, ethics, communication skills and professionalism is given in the fourth semester.

These four semesters are designed to help you acquire the knowledge and skills necessary to undergo the next phase of the study program comprising supervised hands on clinical training.

3rd SEMESTER COURSES

Course No: DS 2101
Course title: Oral Biology
Credits: 4
Pre-requisites: Should have followed Semesters 1 & 2

Aims: This course aims to provide students with a comprehensive knowledge of the oro-facial structures and their function enabling them to apply this knowledge in understanding clinical sciences.

Intended learning outcomes:

On successful completion of the course the students should be able to:

- Describe the regional variations of oral mucosa in relation to function and identify them under the light microscope
- Describe the development of pharyngeal arches, their derivatives and associated congenital anomalies
- Describe the development and associated congenital anomalies of craniofacial structures
- Describe post natal growth of cranio facial structures
- Describe the functional anatomy of the salivary glands and their anatomical relations, and identify them macroscopically and microscopically
- Describe the structure and movements of TMJ, components of TMJ, and muscles of mastication
- Describe the functions, secretory mechanism and the regulation of the salivary secretion
- Describe the defense mechanism of oral cavity
- Describe the functional anatomy of pharynx and larynx
- Describe the mechanisms of mastication, swallowing and speech.

Time Allocation (Hours): **Lectures** 36 **In-class assignments** 16 **Practical** 16 **Discussions** 08 **Self learning:** 124

Course content:

Lectures:	**Hours**
1. Pharyngeal arches	1
2. Fate of the pharyngeal arches	1
3. Development of the face, palate, maxilla and mandible	3
4. Development of the tongue and thyroid gland	1
5. Development of the pituitary and salivary glands	1
6. Congenital anomalies associated with the pharyngeal arches	1
7. Postnatal growth of the cranio-facial complex	3
8. Introduction to the oral cavity	1
9. Functional anatomy of the skin	1
10. Functional anatomy of the oral mucosa	2
11. Gingiva and dento-gingival junction	2
12. Functional anatomy of the lip, cheek and palate	1
13. Functional anatomy of the tongue	1
14. Defence mechanisms of the oral cavity	1

15. Functional anatomy of the salivary glands-morphology, distribution, Relations and histology	2
16. Composition and functions of saliva	1
17. Glandular mechanism of salivary secretion	2
18. Secretion of water, electrolytes and protein	1
19. Regulation of salivary secretion	1
20. Overview of the masticatory apparatus including the muscles of mastication	1
21. Histology, morphology and relations of temporomandibular joint	1
22. Movements of temporomandibular joint and mandible during mastication	1
23. Masticatory cycle and jaw reflexes	2
24. Anatomy of the pharynx and larynx in relation to swallowing and speech	1
25. Suckling and swallowing	2
26. Speech	1
Total	**36**
In class assignment:	
1. Skin and oral mucosa	2
2. Development and growth of the cranio-facial complex	2
3. Functional organization and histology of salivary glands	2
4. Physiology of salivary secretion	2
5. Saliva as a diagnostic tool	2
6. Structure of the masticatory apparatus	2
7. Mastication	2
8. Suckling, swallowing and speech	2
Total	**16**
Practicals:	
1. Histology of skin and oral mucosa	3
2. Anatomy of salivary glands	2
3. Salivary secretion; resting and stimulated saliva	3
4. Saliva as a diagnostic tool	3
5. Anatomy of the temporomandibular joint and occlusion	2
6. Physiology of mastication	3
Total	**16**
Discussions:	

1. Development of the pharyngeal arches, face, and associated malformations	2
2. Clinical significance of the oral mucosa	2
3. Postnatal growth of the cranio-facial complex and its clinical relevance	2
4. Oral somatosensory mechanisms	2
Total	**08**

Recommended References/ Prescribed Textbooks

1. Oral Anatomy, histology and Embryology. BKB Berkovitz et.al. 2010. 04th ed. or later
2. Ten Cate's Oral Histology, Development, structure, & Function. A Nanc. 2008. 06th ed.or later
3. Essentials of Oral physiology. RM Bradley. 1995. 01st ed. or later
4. 2006. Langman's Medical Embryology.TW Sadler. 11th ed. or later
5. 2011. Last's Anatomy. Regional and Applied. Edited by CS Sinnathambi. 12th ed. or later
6. Clinical Oriented Anatomy. KL Moore. 2006. 6th ed. or later
7. Grant's Atlas of Anatomy. AMR Agur and AF Dalley. 2008. 12th ed. or later

Assessment		**Percentage Marks**
In-course		10% - In-course assessment 1- 3 OSPEs 20% - In-course assessment 2- 5 OSPEs
End-semester	Theory	70% - 10 MCQs & 4 SAQs

Course No: DS 2102
Course title: Tooth Morphology and Occlusion
Credits: 3
Pre-requisites: Should have followed Semesters 1 & 2

Aims: This course aims to provide students with a comprehensive knowledge of the occlusion of deciduous and permanent dentitions and the morphology of each tooth enabling them to relate this knowledge to clinical dentistry.

Intended learning outcomes:

On successful completion of the course the students should be able to:

- Precisely identify and describe the morphology of teeth of deciduous and permanent dentitions
- Accurately draw diagrams depicting the morphology of teeth and carve models of teeth with a suitable material
- Chart the teeth
- List and describe the features of the normal occlusion of the deciduous and permanent dentitions and their variations.

Time Allocation (Hours): **Lectures:** 18 **In-class assignments:** 08 **Practical:** 34
Discussions: 06 **Self learning hours:** 84

Course content:

Lectures:	**Hours**
1. Introduction to dental morphology	1
2. Tooth morphology-introduction to terminology and charting of teeth	2
3. Crown and root morphology of permanent incisors and canines	2
4. Crown and root morphology of permanent premolars	2
5. Crown and root morphology of permanent molars	2
6. Crown and root morphology of deciduous teeth	2
7. Occlusion	4
8. Evolution of teeth	1
9. Comparative dental anatomy	1
10. Introduction to dental anthropology	1
Total	**18**
In class assignment:	
1. Morphology of deciduous teeth and permanent teeth	3
2. Clinical application of morphology and occlusion	5

Total	**08**
Practicals:	
1. Morphology of the permanent incisors and canines	3
2. Morphology of the permanent premolars and molars	3
3. Morphology of the deciduous teeth	3
4. Occlusion	3
5. Carving of teeth	22
Total	**34**
Discussions:	
1. Crown and root morphology of deciduous teeth	3
2. Occlusion	3
Total	**06**

Recommended References/ Prescribed Textbooks

1. Oral Anatomy, histology and Embryology. BKB Berkovitz et.al. 2010. 04th ed. or later
2. Wheeler's Dental Anatomy, Physiology, and Occlusion. MM Ash and SJ Nelson. 2010. 9th ed. or later

Assessment		**Percentage Marks**
In-course	Practical	ICA I - 15% - Soap carving of a Anterior tooth ICA II - 15% - Soap carving of a Posterior tooth
End-semester	Theory	50% - 2 SAQs/SEQs
	Practical	20% - 8 OSPEs

Course No: DS 2103
Course title: Introduction to Clinical Sciences - I
Credits: 3
Pre-requisites: Should have followed all courses of semesters 1 and 2

Aims: The course aims to introduce the students to clinical sciences with a detailed understanding of the general principles of human diseases, microorganisms and therapeutics enabling them to make decisions effectively in the management of patients.

Intended learning outcomes:

On successful completion of the course the students should be able to:

- describe the basic principles of disease processes
- describe the pathophysiology of acute and chronic inflammation
- explain the importance of normal microbial flora in health and disease
- describe structure, characteristics, and pathogenic behavior of clinically important microorganisms
- evaluate the importance of sterility and be able to create and maintain a sterile environment for laboratory procedures
- explain the basic concepts of pharmacokinetics and their clinical significance
- explain the basic concepts of pharmacodynamics and their clinical significance
- explain the adverse drug effects and drug-drug interactions
- write correct prescription and a referral to a given clinical scenario
- explain how a normal human being grow and develop from birth to adulthood
- explain the scope of surgical, medical, and critical care management of patients
- explain the importance of clinical history of child and adult patients.

Time Allocation (Hours): **Lectures:** 37 **In-class assignment:** 10
Practical: 6 **Self-learning hours:** 97

Course content:

Lectures:		**Hours**
1.	Microbes and their relevance to dentistry	1
2.	Basic principles of Pharmacology	1
3.	Importance of history taking and examination in assessing general health of a child patient	1
4.	Introduction to surgical management of a patient	1
5.	Introduction to pathological basis of diseases/conditions	1
6.	Introduction to anesthesia and critical care	1
7.	Normal human growth and development	2
8.	General Pharmacology- Pharmacokinetics	3
9.	Microbial structure, growth, and metabolism	1
10.	Host microbial interactions and normal microbial flora	2
11.	Importance of history taking and examination in assessing general	1

	health of a adult patient	
12.	Sterilization & disinfection	2
13.	Acute inflammation	3
14.	Drug metabolism	2
15.	General Pharmacology- Pharmacodynamics	3
16.	Clinical Pharmacokinetics	2
17.	Adverse effects of drugs	2
18.	Drug interactions	2
19.	Drugs used in therapy of commonly encountered clinical problems	1
20.	Chronic inflammation	3
21.	Surgical history taking, examination, investigations	1
22.	Prescription of medication and writing a referral	1
	Total	**37**
In-class assignments		
1.	Pharmacokinetics	2
2.	Normal microbial flora	2
3.	Pharmacodynamics	2
4.	Acute and chronic inflammation	4
	Total	**10**
Practical:		
1.	Staining and visualization of microorganisms	2
2.	Sterilization & disinfection	1
3.	Acute and chronic inflammation	3
	Total	**6**

Recommended References/ Prescribed Textbooks

1. KC Carrol, J Butel and S Morse. 2016. Jawetz, Melnick and Adelberg's Medical Microbiology.27th ed. or later
2. LP Samaranayake.2012. Essential Microbiology for Dentistry.4th ed. or later
3. GM Brenner and C Stevens. 2012. Phamacology. 4th ed. or later
4. RA Harvey et al. 2014. Phamacology (Lippincott's illustrated Reviews Series).6th ed. or later
5. P Kumar and ML Clark. 2016. Kumar and Clark's Clinical Medicine. 9th ed. or later
6. CS Herrington. 2014. Muir's Textbook of Pathology, 15th ed. or later
7. BR Walker et al. 2014. Davidson's Principles & Practice of Medicine. 22nd ed. or later
8. M Longmore et al. 2014. Oxford handbook of Clinical Medicine. 9th ed. or later
9. NS Williams. 2008. Bailey and Love's Short Practice of Surgery. 26th ed. or later
10. G McLatchie et al. 2013. Oxford Handbook of Clinical Surgery. 4th ed. or later

Assessment		**Percentage Marks**
In-course		20% - 4 EMQs
End-semester	Theory	60% - 3 SAQs + 10 MCQs
	Practical	20% - 5 OSPEs/OSCEs

Course No: DS 2104
Course title: Introduction to Clinical Sciences - II
Credit value: 5
Pre-requisites: Should have followed all courses of semesters 1 and 2

Aim: The course aims to impart knowledge to students on infections and immunity, pathophysiology of wounds, pathology of cell injury and pain enabling them to effectively learn and perform management strategies of common infections, immune disorders, wounds and pain

Intended Learning Outcomes:

On successful completion of the course the students should be able to:

- describe the virulence mechanisms of selected microorganisms and their pathogenesis of systemic infections,
- select effective pharmacological agents for microbial infections, and state their modes of action and dosage regimens,
- explain the pathological process of cell injury and its sequalae,
- explain the pathophysiology and the management of wounds,
- explain the procedures involved in collection and transportation of microbiological specimens of patients,
- describe host-response mechanisms of an antigenic challenge,
- explain the mechanisms of abnormal immune responses and outline their management,
- explain the pathophysiology of pain and select appropriate drugs in the management of pain,
- select effective pharmacological agents which act as agonists and antagonists to function of autonomic nervous system and state their mechanisms of actions
- identify the clinical features of common respiratory tract infections and liver diseases within the scope of dentistry
- outline the preventive strategies for common respiratory tract infections and liver diseases within the scope of dentistry
- perform history taking, general examination and assessment of respiratory system
- communicate efficiently with patients and maintain highest professional and ethical standards

Time allocation (Hours): Lectures **53** In-class assignments **16** Practicals**12** Clinical work **24** Self learning hours **145**

Course content

Lectures	**Hours**

1. Gram positive, gram negative bacteria 2. Mycobacteria 3. HIV and hepatitis viruses 4. Fungi of dental relevance; *Candida* 5. Basic pathology related to infectious diseases	8 1 2 1 2
6. Antibacterial drugs 7. Antiviral drugs 8. Antifungal drugs	4 1 1
9. Cellular adaptations 10. Pathological basis of reversible and irreversible cell injury	1 2
11. Surgical infections 12. Antisepsis and asepsis in surgery 13. Pathophysiology of wound healing 14. Management of chronic wounds	1 1 2 1
15. Innate immunity 16. Antigen presentation and recognition 17. Cellular and humoral immune responses	2 2 2
18. Abnormal immune responses 19. Tumour and transplant immunology 20. Immuno-modulation by drugs (corticosteroids) 21. Drugs acting on autonomic functions	2 2 2 2
22. Pathophysiology of pain 23. Pain management with analgesics 24. Local anesthetics used in dentistry 25. Drugs used in general anesthesia and sedation	1 2 2 2
26. Common respiratory infections (bacterial and viral infections; pneumonia and TB) 27. Viral hepatitis and cirrhosis	2 2
Total	53
In class assignments	
1. Gram positive bacteria 2. Gram negative bacteria	2 2

3. Hepatitis B and HIV	2
4. Antimicrobial drugs	2
5. Patho-physiology of cell injury and wound healing	2
6. Local anesthetics	2
7. Immune response	2
8. Abnormal immune response	1
9. Immuno-modulatory drugs	1
Total	16
Practicals	
1. Gram positive and negative bacteria	4
2. Candidiasis	2
3. Cell injury and cellular adaptations	2
4. Collection and transportation process of biological samples	2
5. Immunology	2
Total	12
Ward classes	
1. Ward classes (Medicine)	8
2. Ward classes (Surgery)	8
3. Ward classes (Pediatrics)	8
Total	24

Recommended reading

1. KC Carrol, J Butel and S Morse. 2016. Jawetz, Melnick and Adelberg's Medical Microbiology.27th ed.
2. LP Samaranayake.2012. Essential Microbiology for Dentistry.4th ed.
3. GM Brenner and C Stevens. 2012. Phamacology. 4th ed.
4. RA Harvey et al. 2014. Phamacology (Lippincott's illustrated Reviews Series).6th ed.
5. P Kumar and ML Clark. 2016. Kumar and Clark's Clinical Medicine. 9th ed.
6. Robbins and Cotran Pathologic basis of disease, Kumar, Abbas and Aster; 9th ed
7. CS Herrington. 2014. Muir's Textbook of Pathology, 15th ed.
8. BR Walker et al. 2014. Davidson's Principles & Practice of Medicine. 22nd ed.
9. M Longmore et al. 2014. Oxford handbook of Clinical Medicine. 9th ed.
10. NS Williams. 2008. Bailey and Love's Short Practice of Surgery. 26th ed.
11. G McLatchie et al. 2013. Oxford Handbook of Clinical Surgery. 4th ed.

Assessment		Percentage marks
In-course		ICA-I – 10% 5 EMQ ICA-II - 5% Professionalism 5%- Group case presentation and VIVA
End- semester	Theory	60% - 5 SAQ + 10MCQ
	Practical	20% - 5 OSPE/OSCEs

Course No: DS 2105
Course title: Dental Biomaterials
Credits: 2
Pre-requisites: Should have followed all courses of semesters 1 and 2

Aims: The course aims to teach the physical and chemical properties of materials used in dentistry, which will form the scientific basis for the selection and manipulation of materials used in clinical dental practice.

Intended learning outcomes:
On successful completion of the course the students should be able to:

- explain physical and chemical characteristics of different types of dental biomaterials used in dentistry,
- critically assess and select safe, cost effective and clinically appropriate dental biomaterials for the common preventive/clinical/ laboratory procedures,
- manipulate specified dental biomaterials appropriately and accurately, based on the understanding of the scientific principles of their structure and properties.

Time Allocation (Hours): Lectures: 25 Practicals: 10 Self learning: 65

Course content:

Lectures:		**Hours**
1.	Physical properties of Dental Materials	1
2.	Bio-compatibility and Thermal properties of dental materials	1
3.	Properties of Dental Amalgam	1
4.	Clinical application of Dental Amalgam	1
5.	Phosphate based dental cements and its application	1
6.	Organometallic Chelate cements	1
7.	Properties of Glass ionomer cements	1
8.	Clinical application of glass ionomer cements	1
9.	Introduction to Resins in dentistry	1
10.	Light cured composites	1
11.	Bonding techniques and bio materials	1
12.	Dental Porcelains	1
13.	Impression materials	1
14.	Polymeric impression materials	1
15.	Cast and die materials	1
16.	Waxes used in dentistry	1
17.	Cast metals for denture bases and indirect restorations	1
18.	Precious alloys and Titanium alloys	1
19.	Denture base materials	1
20.	Medicaments used in dentistry	1

21.	Materials used in endodontics	1
22.	Abrasives and dental burs	1
23.	Investment materials	1
24.	Wrought alloys and wires	1
25.	Fluoride preparations and uses	1
	Total	**25**
Practicals		
1.	Manipulation of cements	1
2.	Familiarization of dental burs and endodontic materials	2
3.	Impression trays, manipulation of impression materials and casting	3
4.	Familiarization of waxes used in dentistry	1
5.	Manipulation of restorative materials and bonding procedures	3
	Total	**10**

Recommended References/ Prescribed Textbooks

1. JF McCabe and A Walls. 2008. Applied Dental Materials. 9th ed. or later
2. E Combe, FJT Burke and DW. Bernard. 1992. Dental Biomaterials. 1st ed. or later
3. JM Powers and JC Wataha.2008. Dental Materials: Properties and Manipulation. 9th ed. or later
4. KJ Anusavice. 2003. Phillips' Science of Dental Materials. 11th ed.or later
5. R van Noort. 2007. Introduction to dental materials. 3rd ed. or later

Assessment		**Percentage Marks**
In-course		10% - Mixing of a dental cement
		10% - Mixing of an impression material
End-semester	Theory	60% - 2 EMQs & 5 MCQs, 3 SAQs
	Practical	20% - 5 OSPEs

Prerequisite for ICA

Achieve grade B or above in minimum of two mixing of dental cement/alginate in the clinic

Prerequisite for ESA

Successfully complete the ICA