

Ajman University

College of Dentistry

Ajman / UAE

Course Syllabus of

Applied Basic Sciences II

Course code: 0813620

Department of Basic & Medical Sciences

Lectures: 2 Hours / Week

Credit Hours: 2

First Year – Second Semester

Course Coordinator

Coordinator

Position:

Telephone:

Email: @ajman .ac.ae

Campus: Ajman

Office Hours:

Instructor(s)

Instructor :

Position:

Telephone:

Instructor:

Position:

Telephone:

Email: @ajman.ac.ae

Campus: Ajman

Office Hours: as per teaching schedule

Instructor:

Position:

Telephone:

Email: @ajman.ac.ae

Campus: Ajman

Office Hours:

COURSE DESCRIPTION

1. BASIC INFORMATION

1. Course Title: Applied Basic Sciences II	2. Course Number: 0813620
	3. Number Of Credits: 2
4. Course: Required	5. Number Of Contact Hours: Theory: 2
6. Course Prerequisite (s): 0813610	
7. Course Time: First Year – Second Semester	

2. COURSE CATALOG DESCRIPTION

This foundational course provides students with sound evidence based background knowledge to effectively participate in the evaluation and management of endodontic patients. This course is comprised of lectures discuss selected topics in oral histology, oral pathology, oral medicine, radiology, and periodontology. It is designed to expand student knowledge in the etiology and sequelae of dental caries, in addition, an in depth discussions of the etiology and management of the diseases of supporting tooth structures; namely the periodontium and their inter-relationship with Endodontics is provided. Knowledge gained by the student will contribute to achieving competency in rendering endodontic treatment as well as enhances his/her communication skills with other specialists in a multidisciplinary setting.

3. RELATED PROGRAM LEARNING OUTCOMES

This course contributes to the Program Learning Outcomes

K1, K2

4. COURSE LEARNING OUTCOMES

On the successful completion of this course the graduates will be able to:

1. Discuss the anatomy of the enamel, dentin, cementum and components of the pulp and microscopic features.
2. Discuss the most recent advances in digital imaging used in dentistry and endodontics and Justify the most appropriate radiographic imaging used in identifying abnormal jaw pathologies
3. Enumerate and describe the complications and sequelae of periapical infections and its effect on endodontic therapy.
4. Describe clinical features of pulpo-periodontal problems and appraise the effect of the endodontic therapy on the health of periodontal tissues.

5. COURSE INSTRUCTIONAL OBJECTIVES

The course has been designed to prepare the lifelong graduates to achieve the following objectives:

1. Enamel and Amelogenesis

- Explain the basic microscopic structure of enamel.

- Explain the microscopic observations and clinical consideration.
- List the physical properties of enamel.
- Explain the basic mechanisms involved in the development of enamel.
- Describe the process of enamel formation and maturation.
- Identify the various defects that can occur during enamel formation.
- List the age changes in enamel.

2. Dentin and Dentinogenesis:

- List and explain the physical properties & structural components of dentin.
- Explain detailed microscopic structure of dentin and microscopic observations
- Identify the different types of dentin.
- Describe the process of dentin formation.
- Describe dentin response and repair, age changes and clinical consideration.
- Describe the structure and function of odontoblasts.
- Identify the clinical aspects related to dentin & dentinogenesis.

3. Dental Pulp

- Describe the anatomy of the pulp.
- Describe the histological features of dental pulp.
- Identify the structure and function of dental pulp cells.
- Identify the components of dental pulp such as blood vessels and nerves.
- Explain the pain transmission mechanism.
- Describe the regressive changes of the pulp.
- List the functions of the dental pulp.
- Identify the clinical aspects related to the dental pulp.
- Explain relationship between pulp and periodontium.

4. Cementum

- List physical properties and chemical composition of cementum.
- Describe the clinical and microscopic appearance of cementum.
- Explain the structure and function of cementum.
- Identify the different types of cementum.
- Describe the dentino-cemental and cemento-enamel junctions
- Describe the relationship between cementum and dentin-pulp complex.

- Identify the clinical consideration related to cementum and cementum repair.

5. Dental Caries

- List and explain definition of dental caries, the etiological factors contributing to the initiation and progression of the carious process and its effect on restorative therapy.
- Identify the different theories of dental caries, the different types of carious lesions and its relation to cavity and crown preparation.
- Describe the histopathology of enamel, dentinal and cemental caries.
- Identify the correlate the histopathological features with the clinical findings which influence the treatment planning and its role in future research modalities.

6. Pulp Pathology

- List and explain the classification of the inflammatory disorders of the pulp.
- Identify the etiological factors contributing to the development of pulp pathology and its effect on endodontic treatment.
- Classify and describe acute pulpitis, chronic pulpitis, pulp necrosis and gangrene of the pulp and how these stages influence treatment planning.
- Identify the characteristic features of tooth pain, the different clinical tests to be conducted and assist in the diagnosis.
- Explain the clinical features and histopathology of different types of pulpitis of inflammatory and degenerative pulpal disorders, the regressive changes in pulp and its influence on endodontic treatment.
- Identify the treatment plan based on clinical findings, clinical features and its relation to the histopathological features.

7. Periapical Pathology

- Explain the different types of periapical infections, the etiological factors contributing to the development of inflammatory periapical lesions and its effect on endodontic treatment.
- Describe the differences between periapical and periodontal infections and how these infections can influence the final outcome of endodontic and periodontic therapy.
- List and identify the complications and sequelae of periapical infections and its effect on endodontic therapy.
- Outline the different routes of escape of pus from the periapical regions of different teeth and its relation to subsequent treatment planning.
- Identify the association or absence of pain with regards to a periapical granuloma, periapical abscess and a periapical cyst, and other sequelae that can be associated with pulpitis.

8. Embryology of head and Neck

- Discuss development of pharyngeal arches, pouches & clefts,
- Describe the development of face, tongue, palate, thyroid gland, pituitary gland and salivary glands,
- Discuss the anomalies in the development of face, tongue, palate,
- Describe stages of teeth development.

9. Diagnosis, Examination, Investigations and Treatment Plan

- Define various terms used in diagnosis, examination, investigations, treatment plan and informed consent.
- List of examination techniques and investigations.
- Discuss the concept of Differential Diagnosis.
- Discuss factors affecting Prognosis and treatment planning.

10. Oral Infections and their Relationship to Systemic Disorders

- Classify viral, bacterial and fungal infections affecting the oral mucosa.
- Discuss the clinical diagnosis of viral, bacterial and fungal infections affecting the oral mucosa.
- List the investigations for viral, bacterial and fungal infections affecting the oral mucosa.
- Discuss the treatment of viral, bacterial and fungal infections affecting the oral mucosa.
- Discuss the relation of diseases and their treatment with restorative dental treatment planning.

11. Radiographic Interpretation

- Discuss and identify the normal anatomical landmarks.
- Describe the radiographic features in pulpo periapical diseases.
- Describe the importance of radiographic imaging in identifying abnormal dental jaw pathologies.

12. Recent Advances in Dental Radiology

- Describe digital radiography and discuss its mode of action.
- Discuss the role of cone beam computed tomography in Endodontics.
- Discuss the most appropriate radiographic imaging to be used in Endodontics.
- Discuss the significance of cone beam computed tomography in identifying pathologies in the success of restorative therapy, and particularly in Endodontics.
- Discuss the significance of radiation safety.

13. Periodontium and its Clinical Significance in Endodontic Therapy

- Describe the structures of periodontium.
- Describe the importance of tooth supporting structures.
- Identify the microscopic and macroscopic features of gingiva, periodontal ligament, cementum and bone and its clinical implication.
- Describe the correlation between clinical and microscopic features and its influence on long term success of Endodontic therapy.
- Describe the role of periodontal ligament in new attachment procedure and understand its importance in tooth stability.

14. Classification of Diseases and Conditions affecting the Periodontium and its Influence on Endodontic Treatment

- Classify gingival and periodontal disease.
- Explain aetiology, aetio-pathogenesis and contributory factors of plaque-related and non-plaque-related periodontal diseases based on classifications of periodontal diseases.
- Explain the bidirectional influence of periodontal diseases and systemic diseases/conditions on the outcome of periodontal disease presentation and treatment and its clinical relevance to endodontic treatment

15. Periodontal Microbiology and its Clinical Significance to Endodontic Therapy

- Classify periodontal pathogens.
- Describe the microscopic structure and composition of plaque and its relevance in endodontic treatment.
- Describe the process of plaque biofilm accumulation and maturation.
- Describe the significance of biofilm environment around restored teeth.
- Describe clinical assessment methods to quantify bacterial plaque, biofilm, calculus, and stain.
- Discuss the role of periodontal pathogens in initiation and progression of dental caries.

16. Endodontic-Periodontic Continuum

- Classify Endo-Perio problems.
- Identify the etiology and pathogenesis of Endo-Perio lesions.
- Describe the clinical features of Endo-Perio problems.

- Differentiate Endo-Perio lesions based on the history, pain, location of the swelling and diagnostic test.
- Enumerate various diagnostic tests to differentiate between Endo-Perio lesions.
- Discuss treatment options for management of Endo-Perio lesions
- Discuss the sequence of treatment of Endo-Perio lesions.
- Enumerate the reasons for failures in management of Endo-Perio lesions

17. Biologic Consideration in relation to following Restorative Procedures and its Effect on Periodontium

- Define biologic width and its role in maintaining the health of periodontium.
- Describe the significance of biologic width on long term stability of restoration and periodontal health.
- Discuss the clinical significance of biologic width violation and its signs and symptoms.
- Describe the effect of various restorative materials on the health of the periodontium.

6. COURSE TIME SCHEDULE

Unit	Study Unit Title	Time / Hour	Week
1	Enamel and Amelogenesis	2	1
2	Dentin and Dentinogenesis	2	2
3	Dental Pulp	2	3
	Assignment: topics allocated to individual students		3
4	Cementum	1	4
5	Dental Caries	2	4-5
6	Pulp Pathology , periapical pathology	3	5-6
7	Embryology of head and Neck	2	7
	Mid-term Exam		8
9	Diagnosis, Examination, Investigations and Treatment Plan	2	9
10	Oral Infections and their Relationship to Systemic Disorders	2	10
11	Radiological Interpretation	2	11
12	Recent Advances in Dental Radiology	2	12
13	Periodontium and its Clinical Significance in Endodontic Therapy	1	13
14	Classification of Diseases and Conditions affecting the Periodontium and its Influence on Endodontic Treatment	1	13
15	Periodontal Microbiology and its Clinical Significance to Endodontic Therapy	2	14
16	Endodontic-Periodontic Continuum	1	15
17	Biologic Consideration in relation to following Restorative Procedures and its Effect on Periodontium	1	15
	ASSIGNMENTS : Discussion of assigned articles		15
	Final Exam		16

7. TEACHING AND LEARNING METHODS

- Formal Lectures and Discussions.

8. LEARNING AND INFORMATION RESOURCES

Student's Textbook(s):

- Oral Histology – Development, Structure and Function. A.R. Ten Cate. Mosby; 8 edition , March 22, 2012 ISBN-10: 0323170668
- Oral and Maxillofacial Pathology – 2nd Edition, Neville B.W., Damm D. D., Allen C. M. and Bouquot J. E., Philadelphia, W. B. Saunders,2002
- Cawson's Essentials of Oral Pathology and Oral Medicine by Roderick A. Cawson and Edward Odell Churchill Livingstone (February 26, 2008) ASIN: B00Y4RL5KE
- Oral Radiology: Principles and Interpretation by Stuart C. White and Michael J. Pharoah 7th Edition Elsevier publication December 26, ISBN-13: 978-0323096331
- Carranza's Clinical Periodontology, 12th edition. Michael G. Newman, Henry H. Takei, Fermin A W.B. Saunders Company, 15th August 2014 ISBN-13: 978-0323188241

References

- Orban's Oral histology and Embryology. Edited by S.N. Bhaskar
- [Oral Radiology](#) by Stuart C. Pharoah, Michael J. White
- [Exercises in Oral Radiology and Interpretation](#) by Robert P. Langlais
- Clinical Periodontology and Implant Dentistry. Sixth Edition, Jan Lindhe, Niklaus P lang Wiley Wiley-Blackwell 5th June 2015. ISBN : 978-0470672488
- [Color Atlas of Clinical Oral Pathology](#) by Brad W. Neville, Douglas D. Damm, and Dean K.White.

Dental Journals:

- Journal of Oral Pathology and Medicine
- European Journal of Oral Sciences
- Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics,
- Journal of Periodontology
- Int. J. of Periodontics and restorative dentistry
- Journal of Oral Surgery Oral medicine and Oral Pathology
- Journal of Endodontics
- International Endodontics Journal

9. ASSESSMENT AND EVALUATION

9.1. Assessment Measurements

Unit No	Assessment Measurements
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1,2
9	1,2
10	1,2
11	1,2
12	1,2
13	1,2
14	1,2
15	1,2
16	1,2
17	1,2

- 1) Mid term Examination
- 2) Final Examination
- 3) Assignment

9.1.1 Midterm Examination:

No	Criteria	Level 5 (≥ 90%)	Level 4+	Level 4 (80%)	Level 3+	Level 3 (70%)	Level 2+	Level 2 (60%)	Level 1 (≤ 55%)
5	Overall ability to critically appraise the study								
6	Ability to answer questions								
Final Mark: /20									
Total Marks: Divide by 6 to find mark out of 100. Multiply by 20 and divide by 100 to calculate final mark.									

	Score Distribution
1) Midterm Examination	40%
2) Final Examination	40%
3) Assignment (s)	20 %
Total	100%

10. TECHNOLOGY SUPPORT

10.1 Student's need of software:

Microsoft Word X	Microsoft PowerPoint X	Microsoft Excel X
Microsoft FrontPage	Microsoft Paint	Microsoft Access
Adobe PhotoShop	Sound Edit 16	Internet Tool (E-Mail) X
Online authoring systems (TLM, Blackboard)		
Search Engines (e.g Yahoo, Google, Altavista etc) X		
Others (Specify):		

10.2 Classes and Labs need of software:

Internet Access and E-Mail X	Microsoft Excel
Microsoft PowerPoint X	Microsoft Word X
Data Show Projector X	Scanner / Printer X
Digital Camera	Video and Audio Media Equipment
Others (Specify):	

10.3 The students need to accomplish assignments:

Lab or Production Unit Title	Use (Hours / Week)
1. Multimedia Lab	
2. Audio-visual Lab	
3. Learning Resource Lab	4 hours / week
4. Networking and Communication Lab	2 hours / week
5. Workshop Lab	
6. Photography Unit.	