

1	Course title	Dental Anatomy Theory
2	Course number	1302103
3	Credit hours (theory, practical)	(1 theory, 0 practical)
	Contact hours (theory, practical)	(16 theory (1hr/week), 0 practical)
4	Prerequisites/corequisites	None
5	Program title	Doctor of Dental Surgery (DDS)
6	Program code	Not applicable
7	Awarding institution	The University of Jordan
8	Faculty	Faculty of Dentistry
9	Department	Department of Conservative Dentistry
10	Level of course	Bachelor– Undergraduate
11	Year of study and semester (s)	Year 2 semester 1 2019/2020
12	Final Qualification	DDS
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	

#### 16. Course Coordinator:

<p>Dr. Firas Alsoleihat</p> <p>Office Sunday 10–11</p> <p>Office hours: 9–10am (Sunday &amp; Tuesday), 10–11am (Wednesday)</p> <p>Email: <a href="mailto:firas.alsoleihat@ju.edu.jo">firas.alsoleihat@ju.edu.jo</a></p> <p>Phone: +96265355000/ext. 23592</p>
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#### 17. Other instructors:

None
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#### 18. Course Description:

This course delineates presentation of dental macro- and micro-morphology and evidence-based chronologies of the human dentitions, while reflecting definitive shifts in modern dental practice.

## 19. Course aims and outcomes:

## A- Aims:

- Evidence-based chronologies of the human dentitions provide research standards for tooth development and eruption.
- Detailed descriptions of dimension of teeth from all aspects in relation to space problems and arch size.
- Detailed descriptions and illustrated morphologic features of usual/unusual teeth essential for learning biologic variation of tooth morphology.
- Demonstrations on radiographs and pulp chamber and canal morphology in sectioned teeth provide an excellent reference for root canal therapy.
- Clinically useful chronologies show the age of attainment to avoid damage to developing teeth.
- Age prediction chronologies can be used to assess the unknown age of a patient.
- Outlining the relationship of tooth morphology to the periodontium.
- Expanded coverage of the development process of the primary and permanent dentitions related to diagnosing potential space problems and malocclusion.
- Essential concepts of occlusion relevant to restorative dentistry.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to:

**A. Knowledge and Understanding (student should)**

- A1) Be able to discuss/explain chronology, descriptive morphology, and histology of each type of tooth.  
A2) Be able to make a distinction between permanent and deciduous teeth from one side and among the permanent dentition from another side.

**B. Intellectual skills - with ability to**

- B1) Identify and differentiate each type of tooth  
B2) Employ definitive shifts in modern dental practice

**C. Subject specific skills – with ability to**

- C1) Communicate with the instructors, peers, and patients using understandable terminology and sketches when appropriate.  
C2) Describe the relationship of vital nerves and blood supply of the pulp to tooth morphology and function.

**D. Transferable skills – with ability to**

- D1) Strike the balance between self-reliance and seeking help when necessary.  
D2) Display an integrated approach to the deployment of communication skills.

## 20. Topic Outline and Schedule:

1.					
Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Introduction to Dental	1	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of the anatomy of the jaws and</li> </ul>	Midterm	Wheeler's Dental

<b>Anatomy: Nomenclature, Formulae for Mammalian Teeth, Tooth Notation Systems</b>			<p>dental arches.</p> <ul style="list-style-type: none"> <li>• Having knowledge of the classes of teeth (incisors, canines, premolars, molars)</li> <li>• Having knowledge of the three human dentitions ( primary, mixed and permanent)</li> <li>• Having knowledge of the various types of mammalian dentitions (diphyodont, monophyodont, polyphyodont, homodont, heterodont, anodont)</li> <li>• Having knowledge of dental formulae.</li> <li>• Having knowledge of the various dental notation/numbering systems (Zsigmondy-Palmar, FDI, Universal, Haderup).</li> </ul>	<p>and Final MCQ exams</p>	<p>Anatomy, Physiology, and Occlusion; by Major M Ash &amp; Stanley J Nelson, 9th edition, W. B. Saunders, 2009.</p>
<p>Anatomy of tooth Crown &amp; Root, teeth Landmarks, Division into Thirds, Line Angles, and Point Angles</p>	<p>2</p>	<p>Dr. Firas</p>	<ul style="list-style-type: none"> <li>• Having knowledge of parts of the tooth (the crown (anatomical crown vs. the clinical crown), the root (the anatomical root vs. the clinical root), the cervical line, the pulp cavity (pulp horn(s), pulp chamber, root canal(s))).</li> <li>• Having brief knowledge of dental tissues (enamel, dentin, cementum and pulp).</li> <li>• Having knowledge of the points of reference used in descriptive dental anatomy (median sagittal plane, median line, occlusal plane, proximal (mesial vs. distal), facial (buccal vs. labial), lingual, palatal, occlusal, incisal, apical).</li> <li>• Having knowledge of dental terminology ( cusp, contact point/area, cingulum, developmental lobe, mamelon, ridge (facial ridges, lingual ridges, incisal ridges, cusp ridges, marginal ridges, triangular ridges, transverse ridges, oblique ridges, cervical ridges), fossa (lingual fossa, triangular fossa, central fossa), pit (triangular pit, central pit, buccal pit, lingual pit), developmental groove, supplemental groove, tubercle, embrasure (facial, lingual, occlusal/incisal), inter-proximal space).</li> <li>• Having knowledge of</li> </ul>	<p>Midterm and Final MCQ exams</p>	<p>Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash &amp; Stanley J Nelson, 9th edition, W. B. Saunders, 2009.</p>

			<p>describing the location and position of dental anatomic features by referring to the divisions of the crown and root into thirds, to line angles, and to point angles.</p> <ul style="list-style-type: none"> <li>• Having brief knowledge of dental investing structures (periodontal ligament, alveolar bone, oral mucosa, gingiva, temporomandibular joint, saliva and plaque).</li> </ul>		
Permanent Maxillary Incisors	3	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of morphology, location and function of the permanent maxillary incisors.</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary central incisor and all morphological landmarks apparent on each aspect (mesial, distal, labial, lingual and incisal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary lateral incisor and all morphological landmarks apparent on each aspect (mesial, distal, labial, lingual and incisal).</li> <li>• Having detailed knowledge of the location of contact points and heights of contours of both maxillary central and lateral incisors.</li> <li>• Having detailed knowledge of distinguishing the right from the left in both maxillary central and lateral incisors.</li> <li>• Having detailed knowledge of the morphological variants and anomalies encountered in both maxillary central and lateral incisors.</li> <li>• Having knowledge of the comparative anatomy of maxillary incisors: Incisors of interest in other species (rodents, lagomorphs, sheep, horses, lemurs, the eye eye</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.

			of Madagascar, elephants, the narwhale)		
Permanent Mandibular Incisors	4	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of morphology, location and function of the permanent mandibular incisors.</li> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular central incisor and all morphological landmarks apparent on each aspect (mesial, distal, labial, lingual and incisal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular lateral incisor and all morphological landmarks apparent on each aspect (mesial, distal, labial, lingual and incisal).</li> <li>• Having detailed knowledge of the location of contact points and heights of contours of both mandibular central and lateral incisors.</li> <li>• Having detailed knowledge of distinguishing the right from the left in both mandibular central and lateral incisors.</li> <li>• Having detailed knowledge of the morphological variants and anomalies encountered in both mandibular central and lateral incisors.</li> <li>• Having knowledge of the comparative anatomy of mandibular incisors: Incisors of interest in other species (rodents, lagomorphs, sheep, horses, lemurs, the eye eye of Madagascar, elephants, the narwhale)</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.
Permanent Maxillary & Mandibular Canines	5	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of morphology, location and function of the permanent canines.</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary canine and all morphological landmarks apparent on each aspect (mesial, distal, labial,</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B.

			<p>lingual and incisal).</p> <ul style="list-style-type: none"> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular canine and all morphological landmarks apparent on each aspect (mesial, distal, labial, lingual and incisal).</li> <li>• Having detailed knowledge of the location of contact points and heights of contours of both maxillary and mandibular canines.</li> <li>• Having detailed knowledge of distinguishing the right from the left in both maxillary and mandibular canines.</li> <li>• Having detailed knowledge of the morphological variants and anomalies encountered in both maxillary and mandibular canines.</li> <li>• Having knowledge of the comparative anatomy of canines: Canines of interest in other species (the extinct Smilodon, the walrus, baboons, the male warthog (the wild boar), the wild pig of Malaysia (the barbirussa))</li> </ul>		Saunders, 2009.
Permanent Maxillary Premolars	6	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of morphology, location and function of the permanent maxillary premolars.</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary first premolar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary second premolar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the location of contact points and heights of contours of both maxillary first and second premolars.</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.

			<ul style="list-style-type: none"> <li>• Having detailed knowledge of distinguishing the right from the left in both maxillary first and second premolars.</li> <li>• Having detailed knowledge of the morphological variants and anomalies encountered in both maxillary first and second premolars.</li> </ul>		
Permanent Mandibular Premolars	7	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of morphology, location and function of the permanent mandibular premolars.</li> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular first premolar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular second premolar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the location of contact points and heights of contours of both mandibular first and second premolars.</li> <li>• Having detailed knowledge of distinguishing the right from the left in both mandibular first and second premolars.</li> <li>• Having detailed knowledge of the morphological variants and anomalies encountered in both mandibular first and second premolars.</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.
Permanent Maxillary Molars	8	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of morphology, location and function of the permanent maxillary molars.</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary first molar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.



			<ul style="list-style-type: none"> <li>and occlusal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary second molar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent maxillary third molar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the location of contact points and heights of contours of maxillary first, second and third molars.</li> <li>• Having detailed knowledge of distinguishing the right from the left in the permanent maxillary first, second and third molars.</li> <li>• Having detailed knowledge of the morphological variants and anomalies encountered in the permanent maxillary first, second and third molars.</li> </ul>		
Permanent Mandibular Molars	9	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of morphology, location and function of the permanent mandibular molars.</li> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular first molar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular second molar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</li> <li>• Having detailed knowledge of the description of all aspects of the permanent mandibular</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.

			<p>third molar and all morphological landmarks apparent on each aspect (mesial, distal, buccal, lingual and occlusal).</p> <ul style="list-style-type: none"> <li>• Having detailed knowledge of the location of contact points and heights of contours of mandibular first, second and third molars.</li> <li>• Having detailed knowledge of distinguishing the right from the left in the permanent mandibular first, second and third molars.</li> <li>• Having detailed knowledge of the morphological variants and anomalies encountered in the permanent mandibular first, second and third molars.</li> </ul>		
Deciduous Dentition: Chronology, Morphology & Occlusion	10	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of the importance of the deciduous dentition.</li> <li>• Having knowledge of the dental formula and the notation use for deciduous dentition in various tooth notation/numbering systems.</li> <li>• Having knowledge of the role of the deciduous dentition in development.</li> <li>• Having knowledge of the formation and eruption of deciduous teeth</li> <li>• Having knowledge of the root formation and obliteration in deciduous teeth.</li> <li>• Having knowledge of the transition from the deciduous to the permanent dentition.</li> <li>• Having knowledge of the differences between the deciduous and permanent teeth</li> <li>• Having knowledge of morphology of all deciduous teeth</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.
Occlusion of Permanent	11	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of the interaction between genetics and environment in the development of</li> </ul>	Midterm and Final	Wheeler's Dental Anatomy,

Dentition I			<p>occlusion.</p> <ul style="list-style-type: none"> <li>• Having knowledge of the various factors that summate to determine the development of occlusion (genetic factors, environmental factors, muscular pressure).</li> <li>• Having knowledge of the constant changes in occlusion with development, maturity, and aging.</li> <li>• Having knowledge of Angle classification for normal and malocclusion.</li> <li>• Having knowledge of periods of dental development that affect occlusion (stages of dentofacial development): <ul style="list-style-type: none"> <li>○ The pre-dentition period.</li> <li>○ The deciduous dentition period.</li> <li>○ The mixed dentition period.</li> <li>○ The permanent dentition period.</li> </ul> </li> </ul>	MCQ exams	Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.
Occlusion of Permanent Dentition II	12	Dr.Hiba	<ul style="list-style-type: none"> <li>• Having knowledge of the definitions of the curve of Spee, the curve of Wilson, and the sphere of Monson.</li> <li>• Having knowledge of the definitions of overjet, overbite, open bite, cross-bite.</li> <li>• Having knowledge of the definition and difference between centric occlusion and centric relation.</li> <li>• Having knowledge of the chewing cycle.</li> <li>• Having knowledge of compensating curvatures of the individual teeth.</li> <li>• Having knowledge of posteruptive tooth movement <ul style="list-style-type: none"> <li>○ Continuous tooth eruption</li> <li>○ Physiological mesial drift</li> <li>○ Having knowledge of normal or 'ideal' Occlusion</li> </ul> </li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.

Physiology of Permanent Dentition	13	Dr.Hiba	<ul style="list-style-type: none"> <li>• Having knowledge of the unacceptable theories of tooth eruption: <ul style="list-style-type: none"> <li>○ Vascular pressure and blood vessel thrust.</li> <li>○ Pulpal pressure and pulpal growth.</li> <li>○ Traction by periodontal fibroblasts.</li> </ul> </li> <li>• Having knowledge of the acceptable theories of tooth eruption: <ul style="list-style-type: none"> <li>○ Root elongation</li> <li>○ Alveolar bone remodeling</li> <li>○ Periodontal ligament (in rodents, not in humans)</li> </ul> </li> <li>• Having knowledge of Butler's field theory (Concept of the morphogenetic field)</li> <li>• Having knowledge of malocclusion, disuse theory and the Begg hypothesis.</li> <li>• Having knowledge of the alternation pattern in the human dentition</li> <li>• Having knowledge of dental implication of the secular (generational) growth trend.</li> <li>• Having knowledge of the paramasticatory functions of teeth</li> <li>• Having knowledge of the age changes in teeth</li> <li>• Having knowledge of the self protective features of the dentition: <ul style="list-style-type: none"> <li>○ The axial inclination of teeth.</li> <li>○ The protective contours of teeth (Wheeler's Tooth Deflection Theory)</li> <li>○ The cleansing effect of normal saliva flow and muscular activity (The Morris Muscle Action</li> </ul> </li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.
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			Theory) ○ Having knowledge of mesial and distal curvature of the cervical Line		
Development & Growth of Teeth	14	Dr. Firas	<ul style="list-style-type: none"> <li>• Having knowledge of sequence and timing in dental development.</li> <li>• Having knowledge of Schour and Massler dental development diagrams.</li> <li>• Having knowledge of age estimation of the dentition portrayed on radiographic films or dissected skulls.</li> </ul>	Midterm and Final MCQ exams	Wheeler's Dental Anatomy, Physiology, and Occlusion; by Major M Ash & Stanley J Nelson, 9th edition, W. B. Saunders, 2009.

### 21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Duration: 16 weeks, 16 hours in total
- Lectures: 14 hours, 1 per week + two exams (2 hours)

### 22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

- Midterm exam: a computer aided exam involving single best answer questions and accounting to 40 points of the total
- Final Exam: a computer aided exam involving single best answer questions and accounting to 60 points of the total.

### 23. Course Policies:

A- Attendance policies:

85% Lecture attendance is obligatory. The handout and recommended textbook are not comprehensive and additional material will be covered in lectures.

B- Absences from exams and handing in assignments on time:

The student needs to provide an evidence of the circumstances that forbid him/her from attendance or being on

time, in order to be given a second chance

C- Health and safety procedures:

First aid kit and emergency contacts are available in the teaching venue

D- Honesty policy regarding cheating, plagiarism, misbehavior:

If any of the above is breached by a student, he will be referred to a special judge committee to investigate and judge the case.

E- Grading policy:

Categories: Pass categories: (A, A-, B+, B, B-, C+, C, C-, D+, D, D-) and F (failure)

F- Available university services that support achievement in the course:

Teaching venues, data show appliances, computers lab in the faculty, UJ medical library, UJ main library, e-journal and e-book access.

#### 24. Required equipment:

None special

#### 25. References:

A- Required book (s), assigned reading and audio-visuals:

- **Wheeler's Dental Anatomy, Physiology, and Occlusion;** by Major M Ash & Stanley J Nelson, 9<sup>th</sup> edition, W. B. Saunders, 2009.

B- Recommended books, materials, and media:

- **Dental Anatomy It's Relevance to Dentistry;** by Julian B Woelfel & Rickne C Scheid, 6<sup>th</sup> edition, Williams & Wilkins, 2001.
- **Wheeler's Atlas of Tooth Form;** by Major M Ash, W. B. Saunders, 1984.
- **Orban's Oral Histology and Embryology;** by Bhaskar S N, 11<sup>th</sup> edition, Mosby 1991.
- **Dental Morphology by Van Beek G,** 2nd edition 1983, Butterworth-Heinemann
- **Nature's Morphology: An Atlas of Tooth Shape and Form,** Shigeo Kataoka, Yoshimi Nishimura and Avishai Sadan, Quintessence Publishing (IL); 1 edition 2002

- **Dental Functional Morphology: How Teeth Work** (Cambridge Studies in Biological & Evolutionary Anthropology), Peter W Lucas, Cambridge University Press; 1 edition 2004

## 26. Additional information:

**Expected workload:** an average of studying time from 3 to 4 hours per week should be expected.

Name of Course Coordinator: Dr. Firas Alsoleihat Signature: ----- Date: 27/8/2019

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----