UNIVERSITY OF LOUISVILLE®

SCHOOL OF DENTISTRY

Course Title: Oral Infections

ULSD Course Number: OIID 604
OIID-604-01-4252_syllabus
1 Credit Hour, 3 units
Graded
Spring 2025

Time: Tuesdays 12:00 noon – 1:00PM
Place: Room 305 Dental School

Course Director:
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Course Organization and Objectives: The course is team-taught by ULSD faculty members and consists of lecture sessions, student presentations and group discussion sessions, and projects. It draws students from the post-graduate Residency Programs, the DMD program, and various M.Sc. programs, including the M.Sc. in Oral Biology Program. This course fulfills one of the elective requirements for all M.Sc. programs offered by ULSD. The main objective of OIID 604 is to provide students with a basic understanding of the oral microbiota implicated in health and infectious diseases, dental plaque, the etiology of common oral infectious diseases, and the virulence mechanisms of bacterial, viral, and fungal pathogens associated with these diseases,

along with host defense mechanisms. Students will also be exposed to current topics in oral infections and immunology, such as the link between oral diseases and systemic illnesses, as well as research efforts to develop new therapeutic approaches for treating and preventing oral diseases

Course content and Panopto recordings of lectures will also be posted online on Blackboard.

Textbook: There is **no required** textbook for OIID 604 but a relevant reference text is listed below. In addition, some class sessions will review or refer to specific scientific papers that will be provided to the students via Blackboard before the lecture period.

Oral Microbiology and Immunology, 3rd Edition, R.J. Lamont, G.N. Hajishengallis, M. Koo and H.F. Jenkinson (Eds.), ASM Press, ISBN-10: 1555819982, ISBN-13: 978-1555819989

Student attendance and mechanism of assessment: *Student attendance is mandatory and participation during classroom discussions is required*. Frequent absences or tardiness will negatively affect the final grade. Student performance evaluation will be derived from two exams, given assignments, student presentations, and contributions to the class discussions. The exams will be administered as listed in the course schedule below. Together, the exams account for 60% of the final grade (30% for each exam). Student presentations (20%), participation in group discussions (10%), and assigned coursework (10%) will make up the remaining 40% of the final grade.

The grade minimum for passing this course is C+. However, the grade minimum for passing the requirement in each ULSD program may vary and is determined by ULSD program directors.

The final grade will be presented as shown below:

Course grade	Approximate percent score
A+	97---100
A	90---96.9
A-	86---89.9
B+	83---85.9
B	79---82.9
B-	74---78.9
C+	69---73.9
C	64---68.9
C-	59---63.9
D	55---58.9
F	< 55

Course Schedule:

1/07 **Moradali** – **Introduction to the Oral Microbiota and Host-Microbiome Interactions**

This session provides a foundational overview of the oral microbiota and its role in health and disease. Key topics include:

- The ecological plaque hypothesis and its relevance to common oral infections.
- The concepts of commensalism and pathogenicity.
- Overview of oral commensals, pathogens, and their interactions with the host.
- Roles of accessory pathogens, pathobionts, and keystone pathogens.
- The implications of polymicrobial synergy and dysbiosis in oral infections.

1/14 **Moradali** – **Oral Biofilm and Pathoadaptation of Infectious Agents**

This lecture examines dental plaque as a microbial biofilm, which underpins persistent and chronic infections. Topics covered include:

- The key microbial players in dental plaque formation.
- The structure and constituents of biofilms.
- Pathogen strategies for immune evasion and antibiotic resistance.

1/21 **Ramsey** – **Etiology of Dental Caries as an Infectious Disease**

This session focuses on the microbial etiology of dental caries and its contributing factors. Topics include:

- Identification of primary cariogenic pathogens.
- Microbe-microbe interactions influencing caries severity.
- Factors promoting cariogenic dental plaques and caries development.
- The role of microbial physiology and saccharide metabolism, particularly sucrose, in caries progression.

1/28 **Scott** – **Dental Plaque-Induced Gum Inflammation and Disease-Promoting Factors.**

This lecture delves into the microbial causes of gum inflammation, highlighting:

- The microbial etiology of gingivitis in both adults and children.
- Host-pathogen interactions and their dynamics in gingivitis.
- Key microbial immunostimulatory factors and other disease-promoting elements.
- The role of smoking in exacerbating gum disease.

2/04 **Potempa** – **Etiology of Periodontitis as a Tissue-Destructive Disease**.

This session explores periodontitis as a tissue-destructive condition. Topics include:

- The microbial etiology of periodontal disease in adults.
- Identification of major periodontal pathogens.
- Mechanisms contributing to tissue destruction and bone resorption.

2/11 **Exam 1**- at 12:00 noon to 1:00 pm Room 305 (**would cover material from the first session through Etiology of Periodontitis as a Tissue-Destructive Disease with Dr. Potempa)**

2/18 **Uriarte** - **Oral Infections and Systemic Diseases**.

This lecture will explore the mechanistic links between oral infections and systemic diseases, focusing on:

- Chronic inflammatory diseases affecting periodontal tissues.
- Co-morbidities associated with periodontitis.
- How periodontal pathogens manipulate host innate and adaptive immunity.
- Translocation of bacteria and bacterial agonists to extra-oral sites.
- Overcoming anatomical and microbial barriers to colonize distant tissues.
- Oral dysbiosis and its connection to colitis.
- Oropharyngeal transmission and aspiration pneumonia.
- The placental microbiome and implications for pregnancy.
- The role of *Porphyromonas gingivalis* in Alzheimer's Disease (AD).
- Links between periodontitis and rheumatoid arthritis (RA).

2/25 **Ghods & Moradali** - **Student Presentation & Group Discussion**

This session will be dedicated to student presentations and group discussions, allowing for the exchange of ideas and application of course material to collaborative learning activities.

3/04 **Diamond** – **Fungal Infections of the Oral Cavity.**

This lecture will provide an introduction to oral fungal infections, focusing on:

- The unique characteristics of Candida species.
- Pathogenesis and clinical manifestations of oral fungal infections.
- Current therapeutic approaches to control and treat fungal infections.

3/11 Spring Break

3/18 **Diamond** – **Viral Infections of the Oral Cavity**.

This lecture will provide an overview of oral virology, with a focus on:

- The Herpesviruses, including:
- α-Herpesviruses (Herpes Simplex Virus Types 1 and 2).
- β-Herpesviruses (Cytomegaloviruses).
- γ-Herpesviruses (Epstein-Barr Virus).
- Papillomaviruses and their role in oral warts.

3/25 **Sabey** - **Endodontic Infections and Treatment Strategies**.

This lecture will cover the nature and management of endodontic infections, with topics including:

- The mixed microbial etiology of endodontic infections.
- Common sources and pathways of infection.
- Current and emerging treatment strategies for managing endodontic infections.

4/01 **Ghods & Moradali** - **Student Presentation & Group Discussion**

This session will continue with student presentations and group discussions, fostering peer engagement and knowledge application.

4/08 **Ghods & Moradali** – **Student Presentation & Group Discussion**
This session will continue with student presentations and group discussions, fostering peer engagement and knowledge application.

4/15 **Perpich** - **Oral Disease Prevention**.
This lecture will focus on new approaches to oral disease prevention, including:

- Advances in vaccination strategies.
- Development of pathogen-specific therapies.
- Innovative interventions targeting oral pathogens.

4/22 **Exam 2** -at 12:00 noon to 1:00 pm Room 305 **(would cover material from Oral Infections and Systemic Diseases with Dr. Uriarte through Oral Disease Prevention with Dr. Perpich, and topics discussed during group presentations and discussion, emphasizing on critical analysis of research data)**

Title IX/Clery Act Notification

Sexual misconduct (including sexual harassment, sexual assault, and any other nonconsensual behavior of a sexual nature) and sex discrimination violate University policies. Students experiencing such behavior may obtain **confidential** support from the PEACC Program (852-2663), Counseling Center (852-6585), and Campus Health Services (852-6479). To report sexual misconduct or sex discrimination, contact the Dean of Students (852-5787) or University of Louisville Police (852-6111).

Disclosure to **University faculty or instructors** of sexual misconduct, domestic violence, dating violence, or sex discrimination occurring on campus, in a University-sponsored program, or involving a campus visitor or University student or employee (whether current or former) is **not confidential** under Title IX. Faculty and instructors must forward such reports, including names and circumstances, to the University's Title IX officer.

For more information, see the Sexual Misconduct Resource Guide (http://louisville.edu/hr/employeerelations/sexual-misconduct-brochure).