

# DOCTOR OF PHILOSOPHY IN NATURAL SCIENCES: ORAL AND CRANIOFACIAL SCIENCES

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## Student Learning Outcomes

Students graduating from this program will:

As part of the Natural Sciences Ph.D. program, students in a primary discipline of Oral and Craniofacial Sciences must meet the minimum Ph.D. program requirements. These can be found within the main program page (<https://catalog.umkc.edu/colleges-schools/graduate-studies/phd-programs/>) and subsequent requirement pages.

## Oral and Craniofacial Sciences

Please see the School of Graduate Studies web page (<https://sgs.umkc.edu/academics/nat-sci-coordinators.html>) for the contact information for the discipline Coordinator. To view all doctoral and graduate faculty in Oral and Craniofacial Sciences, see this web page (<https://sgs.umkc.edu/faculty-and-staff/doctoral-graduate-faculty-lists.html>).

## Admission Requirements

Applicants must meet both the general and the discipline-specific criteria for admission and be recommended for admission by the faculty review group. Upon approval by the graduate dean, students are admitted to the School of Graduate Studies.

Please see the website (<https://sgs.umkc.edu/admissions/natural-sciences-apply.html>) for updated application deadlines.

In addition to the general minimum requirements for admission to Ph.D. study, an applicant must hold either (1) a baccalaureate degree, (2) an M.S. degree, or (3) a D.D.S. or equivalent degree. In general, an applicant will be expected to have a minimum cumulative GPA of 3.0 based on a 4.0 scale for previous education programs, including dental school (if applicable).

The GRE is not required but is preferred. Submitting GRE scores can strengthen an application. Below are the typical GRE standards for reference:

- Quantitative: 150
- Verbal: 155
- Analytical Writing: 4.0

International applications should reference the International Student Affairs Office English Proficiency Testing Requirements (<https://www.umkc.edu/isao/future-students/english-proficiency.html>).

All application materials should be submitted prior to March 1 for students wishing to begin their study in the fall semester; however, applications will be accepted throughout the year. Evaluation criteria include the following:

- Transcripts. Analysis of transcripts from all prior institutions is required.
- Letters of recommendation. Three letters of recommendation are required from current or former teachers who are familiar with the applicant's past achievements and research ability.
- Personal statement from applicant. The applicant must submit a letter describing why he or she is interested in pursuing a Ph.D. study in oral and craniofacial sciences, how the experience of the program may be used by the candidate in the future, and a list of potential research interests.
- Interviews. Interviews are not required; however, interviews are preferred and will be arranged upon the candidate's request. Successful interviews may enhance the candidate's chance of acceptance.

## Discipline Overview

Oral and Craniofacial Sciences is for students focused on craniofacial development, bioengineering, biomaterials, oral health, & biological mechanisms. Students work with academic advisor to select courses and pursue research in 1 of 3 focus areas: Biomaterials/Bioengineering of Biological Tissues, Craniofacial Development and Mineralized Tissue Biology, and Translational/Clinical Research. Curriculum with supervised research and courses such as biomaterials, research design/methodology, statistics, biochemistry, and genomics prepare students for positions in universities and corporations.

## Core Coursework Requirements

Students with an Oral and Craniofacial Sciences primary discipline will complete a minimum of 42 credit hours for the degree. This includes at least 12 credit hours in the primary discipline, 9 hours outside the primary discipline (decided in consultation between the student and primary advisor), 9 credit hours of electives, and at least 12 hours of dissertation credit in the primary discipline.

**Primary Discipline**

Code	Title	Credits
<b>Required Core Curriculum:</b>		<b>12</b>
BIO-SCI 5751	Elements of the Scientific Method	
BIO-SCI 5752	Research Methods in Oral and Craniofacial Sciences	
RES-ME 5700	Introduction to Research Methodology	
RES-ME 5704	Introduction to Biostatistics	
<b>Additional Courses Applicable to Discipline:</b>		
BIO-SCI 5710	Genetics and Biochemistry of Cranial Facial Biology	
BIO-SCI 5739	Biomaterials for the Dental Specialist	
BIO-SCI 5740	Oral Pathology	
BIO-SCI 5742	Biomaterials for the Restorative and General Dentist	
BIO-SCI 5759	Special Problems in Pharmacology	
BIO-SCI 5760	Physiology of Oral Mineralized Tissues	
BIO-SCI 5790	Directed Research In Oral and Craniofacial Sciences	
BIO-SCI 5802	Immunopathology	
BIO-SCI 5805	Molecular Biology of Oral Microflora	
MEDB 5561	Responsible Conduct of Research	
Coursework Outside of Primary Discipline (either in designated secondary discipline or multiple other disciplines) <sup>1</sup>		9
Electives (coursework can be from any discipline)		9
Dissertation		12
<b>Total Credits</b>		<b>42</b>

**Total Credit Hours: 42**

<sup>1</sup> Minimum of 9 hours with possibility of more required. Decided in consultation with primary advisor.

**Secondary Discipline**

Students with an Oral and Craniofacial Sciences secondary discipline will complete a minimum of 9 credit hours in the discipline.

Code	Title	Credits
A minimum of 9 credit hours, selected from the applicable courses below		9
BIO-SCI 5751	Elements of the Scientific Method	
BIO-SCI 5752	Research Methods in Oral and Craniofacial Sciences	
RES-ME 5700	Introduction to Research Methodology	
RES-ME 5704	Introduction to Biostatistics	
BIO-SCI 5710	Genetics and Biochemistry of Cranial Facial Biology	
BIO-SCI 5739	Biomaterials for the Dental Specialist	
BIO-SCI 5742	Biomaterials for the Restorative and General Dentist	
BIO-SCI 5743	Advanced Seminar in Dental Biomaterials	
BIO-SCI 5760	Physiology of Oral Mineralized Tissues	
MEDB 5561	Responsible Conduct of Research	
<b>Total Credits</b>		<b>9</b>

**Departmental Research Orientation**

Enrollment in BIO-SCI 5751 (<https://catalog.umkc.edu/search/?P=BIO-SCI%205751>) required

- Ph.D. students will select and rotate through a minimum of four laboratories in the Department of Oral and Craniofacial Sciences conducting a short research project in each. At the end of the semester, a report is required reviewing the research project and instrumentation in each laboratory. Students are also required to attend the weekly Department of Oral and Craniofacial Sciences Seminar Series and the monthly Professional Development Seminar Series. Research presentations cover a variety of biological, engineering and behavioral science disciplines relevant to oral science education and the oral health care profession. Presentations will be by faculty, students, and invited guest lecturers.

Enrollment in BIO-SCI 5752 (<https://catalog.umkc.edu/search/?P=BIO-SCI%205752>) required

- As the student identifies a research focus for the dissertation project, they will begin reviewing the literature and relevant instrumentation in conjunction with a selected research advisor.

#### Thesis and Dissertation Defense Exams

- Graduate students are expected to attend all thesis and dissertation defense exams

### Other Discipline-Specific Special Requirements

#### Dissertation Research

In accordance with general Ph.D. program requirements, each student with Oral and Craniofacial Sciences as the primary discipline must submit a dissertation proposal, prepared in consultation with the student's dissertation chair, which describes a program of original research on a significant problem in Oral and Craniofacial Sciences. The proposal will be reviewed by the student's Ph.D. supervisory committee. The student may be required to revise and resubmit the proposal to the supervisory committee. A copy of the accepted proposal will then be forwarded to the School of Graduate Studies.

The student must provide evidence that a substantial portion of the dissertation will be submitted for publication to refereed journals. Such proof may be in the form of a manuscript in preparation for submission or a submitted manuscript. The student must submit the complete dissertation, in electronic form, to his or her faculty advisor for review and preliminary approval at least eight weeks before the expected date of graduation.

#### Appeals

In the event of disputes or special requests concerning a student's Ph.D. program, written appeals or documentation must first be submitted to the student's supervisory committee. If a resolution of the problem cannot be affected at that level, the written appeals process takes effect.

#### Academic Retention

A 3.0 or better grade-point average is required of all work applicable to the Ph.D. program. A Ph.D. student with oral and craniofacial sciences as a discipline is subject to termination from the Ph.D. program if: (1) his or her grade-point average falls below 3.0; (2) more than four hours of C (2.0) grades are received; or (3) any grade of D or F is received.

A recommendation for termination from the program will be made by the student's dissertation chair to the program director. The next level of review would be the department chair, associate dean for research and graduate programs, and then the Ph.D. Program Director and the Dean of the School of Graduate Studies.

#### Comprehensive Examination Guidelines

A Comprehensive Examination will be administered to all students enrolled in the Ph.D. program whose subject emphasis area is Oral and Craniofacial Sciences. The examination includes both written and oral components. Content of the Comprehensive Examination will be tailored to the student's field of research interest and prepared with input from all members of the student's supervisory committee.