

ORAL BIOLOGY (MOB)

Program Director: Mark Latta

Program Office: Boyne 351

GRADUATE STUDY IN ORAL BIOLOGY

The graduate program in Oral Biology is a program of study culminating in the Master of Science degree. The proposed program is flexible and will foster an interdisciplinary approach using School of Dentistry research, courses and facilities to cater to the needs of individual students. A thesis will be required. The program will be geared towards providing a sound didactic basis for students interested in pursuing dentistry as a profession. It will also provide research opportunities and teaching experience in an effort to model graduate students for an academic career as clinician educators and academic dentists.

The program will provide a choice of two tracks of study. The first will be in dental materials and include didactic and research emphasis in modern materials science. The second will be in oral biology and emphasize didactic and research in anatomical sciences and histology. Both tracks will equip students to analyze research and clinical literature. Both will also provide an opportunity in the second year to teach in 1st year pre-doctoral dental laboratory courses.

Program Goals

At the time of the completion of the program the graduates will be able to meet the following objectives:

1. Demonstrate disciplinary competence and proficiency in Oral Biology with a global perspective on Oral Health and dentistry provide a service to others.
2. Demonstrate an ability to combine critical thinking, research and problem solving in Oral Biology.
3. Demonstrate ethical decision making, service and responsibility in accordance with the Judeo-Christian tradition and Ignatian values.
4. Demonstrate the ability to work effectively as mentees and mentors across the distinctions of the diverse faculty, students and staff involved in the graduate experience.
5. Respectfully and effectively communicate information through all modes of expression.
6. Demonstrate deliberative reflection for lifelong personal and professional formation.

Master of Science (M.S.) with a Major in Oral Biology

Dental Materials Track

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| MOB 500 | Dental Materials/Dental Anatomy Lecture I | 2 credits |
| MOB 501 | Dental Materials/Dental Anatomy Laboratory I | 2 credits |
| MOB 502 | Polymer Chemistry | 3 credits |
| MOB 503 | Special Problems in Dental Materials I | 1 credit |
| MOB 504 | Dental Materials Dental Lecture II | 2 credits |
| MOB 505 | Dental Materials Laboratory II | 1 credit |
| MOB 506 | Introduction to Biostatistics and Its Applications | 2 credits |
| MOB 507 | Polymer Chemistry Laboratory | 3 credits |
| MOB 508 | Special Problems in Dental Materials II | 1 credit |
| MOB 600 | Teaching Practicum in Dental Materials | 2 credits |
| MOB 601 | Mechanical Behavior of Materials | 2 credits |
| MOB 602 | Special Problems in Dental Materials III | 1 credit |
| MOB 603 | Research for the Master's Thesis | 3 credits |
| MOB 604 | Teaching Practicum In Dental Materials | 2 credits |
| MOB 605 | Advanced Biomaterials Science | 2 credits |
| MOB 606 | Special Problems in Dental Materials IV | 1 credit |
| MOB 700 | Research for the Master's Thesis | 6 credits |

Anatomical Sciences Track

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| MOB 509 | General Gross Anatomy | 4 credits |
| MOB 510 | Histology | 3 credit |
| MOB 511 | Special Problems in Oral Biology | 1 credit |
| MOB 512 | Head & Neck Anatomy/Teaching Techniques | 3 credits |
| MOB 513 | Oral Histology & Embryology | 3 credits |
| MOB 514 | Introduction to Biostatistics and Its Applications | 2 credits |
| MOB 515 | Special Problems in Oral Biology II | 1 credits |
| MOB 607 | Teaching Practicum in Histology | 1 credits |
| MOB 608 | Special Problems in Oral Biology III | 1 credits |
| MOB 700 | Research for the Master's Thesis | 3 credits |
| MOB 610 | Teaching Practicum in Head & Neck Anatomy | 3 credits |
| MOB 611 | Teaching Practicum in Oral Histology & Embryology | 1 credit |
| MOB 612 | Special Problems in Oral Biology IV | 1 credit |
| MOB 700 | Research for the Master's Thesis | 6 credits |

MOB 500 Dental Materials/Dental Anatomy Lecture I (2)

The fundamentals of dental materials science will be presented as it applies to clinical and laboratory dental applications. The physical properties and the rationale for material selection as dictated by intended use will be presented. An orientation to dental anatomy will be reviewed to create the basis for applying restorative materials to tooth form and function.

MOB 501 Dental Materials/Dental Anatomy Laboratory I (2)

Specific dental laboratory projects will be accomplished to allow the student to become familiar with the handling characteristics of the dental materials presented in lecture. This will help to ensure competent use of commonly used dental materials at the clinical level. These exercises are also designed to improve manual dexterity and eye-hand coordination.

MOB 502 Polymer Chemistry (3)

The goal of this course is to expose students to the fundamentals of polymer chemistry. The course will focus on some of the key synthetic methods and physical properties of polymers. Practical applications of polymer chemistry in society will be a theme throughout the course.

MOB 503 Special Problems in Dental Materials I (1)

Topics of interest to the student, literature review, development of research protocol.

MOB 504 Dental Materials Dental Lecture II (2)

Composition and properties of materials in dentistry.

MOB 505 Dental Materials Laboratory II (1)

Application of materials used in dentistry with an emphasis on restorative material application.

MOB 506 Introduction to Biostatistics and Its Applications (2)

Organizing and summarizing; elementary probability; sampling distributions, confidence intervals; hypothesis testing using parametric and non-parametric methods; sample size and power; regression and correlation; analysis of variance; experimental design principles and analysis.

MOB 507 Polymer Chemistry Laboratory (3)

The goal of this course is to expose students to the fundamentals of polymer syntheses and characterization. The course will focus on some of the key synthetic methods for making plastics and the characterization techniques for determining the physical properties of the polymers.

MOB 508 Special Problems in Dental Materials II (1)

Topics of interest to the student, literature review, development of research protocol.

- MOB 509 General Gross Anatomy (4)**
Basic instruction in the gross anatomy of the upper extremity, thorax, and abdomen. This class is taught primarily by lecture, laboratory dissection, models, radiographic images, and various multimedia resources. Students are expected to meet with the instructors to complete additional requirements in current clinically relevant topics.
- MOB 510 Histology (3)**
Microscopic anatomy of normal mammalian and/or human tissues and organs. Light and electron microscopic aspects of the tissues and organs are studied. The developmental anatomy of the organ systems will also be presented. Students are expected to meet with the instructors to complete additional requirements in current clinically relevant topics.
- MOB 511 Special Problems in Oral Biology (1)**
Topics of interest to the student, literature review, development of research protocol.
- MOB 512 Head & Neck Anatomy/Teaching Techniques (3)**
Basic instruction in the Gross Anatomy of the Head and Neck. Special emphasis is placed on the clinical application of the anatomy to the various dental disciplines. Such topics include the anatomy and pathology of the TMJ and the distribution of the trigeminal and facial nerves with associated applied anatomy. This course is taught by lecture, laboratory dissection, models, radiographic images (x-rays, MRIs, and CTs), and various multimedia resources. Students are expected to meet with the instructors to complete additional requirements in current clinically relevant topics.
- MOB 513 Oral Histology & Embryology (3)**
Microscopic and developmental anatomy of the normal cells, tissues, and organs of the oral cavity with stress on teeth and related tissues. Emphasis will be given to the growth and development of the head and neck. Students are expected to meet with the instructors to complete additional requirements in current clinically relevant topics.
- MOB 514 Introduction to Biostatistics and Its Applications (2)**
Organizing and summarizing; elementary probability; sampling distributions, confidence intervals; hypothesis testing using parametric and non-parametric methods; sample size and power; regression and correlation; analysis of variance; experimental design principles and analysis.
- MOB 515 Special Problems in Oral Biology II (1)**
Topics of interest to the student, literature review, development of research protocol.
- MOB 600 Teaching Practicum In Dental Materials (2)**
By assisting in the laboratory classroom teachers and working with students one-on-one in small groups, students will gain knowledge and skills to be successful in teaching Dental Materials. The practicums are an opportunity to place into practice theories and approaches explored during first year coursework. Instructional methods and teaching aids for the teaching of biomaterials science to dental students dental hygiene students and Oral Biology graduate students.
- MOB 601 Mechanical Behavior of Materials (2)**
Principals of mechanical damage in materials, elastic and plastic deformation, creep strength fracture and fatigue hardness and wear resistance mechanical test methods and failure analysis.
- MOB 602 Special Problems in Dental Materials III (1)**
Topics of interest to the student, literature review.
- MOB 603 Research for the Master's Thesis (3)**
- MOB 604 Teaching Practicum In Dental Materials (2)**
By assisting in the laboratory classroom teachers and working with students one-on-one in small groups, students will gain knowledge and skills to be successful in teaching Dental Materials. The practicums are an opportunity to place into practice theories and approaches explored during first year coursework.
- MOB 605 Advanced Biomaterials Science (2)**
Properties and applications of ceramics and glasses in dentistry. Ceramics for inlays onlays and veneers, crowns and denture teeth, core ceramics metal ceramics, ceramics for implants machinable ceramics, hydroxyapatite.

- MOB 606 Special Problems in Dental Materials IV (1)**
Topics of interest to the student, literature review.
- MOB 607 Teaching Practicum In General Gross Anatomy (3)**
By assisting in the laboratory classroom teachers and working with students one-on-one in small groups, students will gain knowledge and skills to be successful in teaching General Gross Anatomy. The practicums are an opportunity to place into practice theories and approaches explored during first year coursework. Students complete a 5-week intensive course with a supervising instructor in order to refine and expand upon their teaching skills. Students are expected to meet all professional responsibilities including attendance, punctuality, appearance and professional relationships.
- MOB 608 Teaching Practicum In Histology (1)**
By assisting in the laboratory classroom teachers and working with students one-on-one in small groups, students will gain knowledge and skills to be successful in teaching Histology. The practicums are an opportunity to place into practice theories and approaches explored during first year coursework.
- MOB 609 Special Problems in Oral Biology III (1)**
Topics of interest to the student, literature review.
- MOB 610 Teaching Practicum In Head & Neck Anatomy (3)**
By assisting in the laboratory classroom teachers and working with students one-on-one in small groups, students will gain knowledge and skills to be successful in teaching Head & Neck Anatomy. The practicums are an opportunity to place into practice theories and approaches explored during first year coursework
- MOB 611 Teaching Practicum In Oral Histology & Embryology (1)**
By assisting in the laboratory classroom teachers and working with students one-on-one in small groups, students will gain knowledge and skills to be successful in teaching Oral Histology and Embryology. The practicums are an opportunity to place into practice theories and approaches explored during first year coursework.
- MOB 612 Special Problems in Oral Biology IV (1)**
Topics of interest to the student, literature review.
- MOB 700 Research for the Master's Thesis (3-6)**
This course can be repeated to a maximum of six credits.

