Course Title: Intensive Research Elective Course (IREC)

Course Goal: The goal of the Intensive Research Elective Course (IREC) is to provide intensive, structured research experience throughout the dental school curriculum for students who are interested in careers in oral health research.

The IREC components include mentored research and a completed project.

Mentored Research: There are three sections to mentored research:
- IREC1 - Intensive Research DMD year1 under Apex;
- IREC2 - MB 652 Intensive Research DMD year2 (2 credits);
- IREC3 - MB 653 Intensive Research DMD year3 (2 credits).

Completed Project: Students need to successfully complete the mentored project and report the results at Science Day and at other scientific events.

Expected Number of Students: 1-5

Research Training Components and Eligibility

Because of its unique curriculum, the GSDM offers formal research training for credit to students. Students who maintain a 3.0 GPA or higher in their didactic and clinical courses are considered for research training. Students selected by Committee can participate in the Program.

1- The first-year training takes place following the completion of the DMD didactic courses during the Apex rotation from May to July. The rotation is based on a five-day week as follows:
   a. Students dedicate two days for research training and three days for the Apex clinical assignment. Or
   b. IREC1 training which requires three days for research training (30 hours per week) and two days for the Apex clinical assignment. Students are considered for the IREC1 if they have participated in research during the second semester of their dental education on a voluntary basis or if they have prior research experience.
   c. IREC1 trainees will be graded by the end of the Apex rotation.

2- The IREC2 (MB652) takes place during DMD year 2. Students who completed IREC1 training or those with prior research experience can apply.
   a. The expected number of hours is 100 contact hours minimum in the laboratory or in the clinical setting. The activities outlined below need to be accomplished outside the contact hours.
   b. Students need to successfully complete the mentored project and present it at Science Day and/or at other scientific events.
   c. IREC2 trainees will be graded by the end of DMD year 2.
3- The IREC3 (MB653) takes place during DMD year 3. Students who completed IREC1 and/or IREC2 training or those with prior research experience can apply.
   a. The expected number of hours is 100 contact hours minimum in the laboratory or in the clinical setting. The activities outlined below need to be accomplished outside the contact hours.
   b. Students need to successfully complete the mentored project and report the results at Science Day and/or at other scientific events. The project could be an ongoing product throughout the IREC training.
   c. IREC3 trainees will be graded by the end of DMD year 3.

Applications Deadline: February 1 for IREC1 and ongoing for IREC2 and IREC3.

Drop-outs within the first four weeks of the start of training will get “W”.

The Assistant Director of Pre-doctoral Research is responsible for monitoring progress of the students, tracking time sheets and communicating with the Office of Academic Affairs and the Office of the Registrar.

Course Objectives

• To carry out well-defined research projects under the guidance of research mentors
• To enhance critical thinking skills
• To participate in the full range of research-related activities, including scientific meetings and journal clubs. Scientific meetings will provide platforms for discussions of research findings, for troubleshooting research strategies and methodologies and for critiquing results and their interpretation
• To train in the design and execution of scientific studies, gain better understanding of innovative dental techniques, materials and tools, develop analytical thinking abilities, contribute to the dental literature by publishing results, showcase accomplishments at local, national and international scientific meetings, become more informed dental clinicians and improve eligibility for academic appointments
• To contribute to the discovery of new knowledge

Activities

Project Development
IREC trainees work together with their mentors on the preparation of research proposals through literature reviews, analyses of preliminary data and pilot studies. Project description includes concept definition, formulation of specific hypotheses, aims and timelines, as well as expected outcomes. Mentors assigned to train IREC students assume the responsibility for supporting the students through the selection, design and execution of a project. Once the project is completed, students are expected to present at local, national or international meetings.
Seminar Series
The PRP office organizes a seminar series through which IREC trainees learn about different scientific methodologies and approaches. These seminars enrich the trainees' research experience by exposing them to the latest scientific findings and facilitate development of personal relationships among peers.

Journal Club
Each trainee is required to attend at least one journal club directed at developing skills in the critical evaluation of literature by critiquing a research paper.

Scientific Writing, Presentation and Communication Skills
The PRP office assists the IREC trainees in the presentation of the research accomplishments at scientific meetings. An emphasis is made on improving writing, presentation and communication skills. Scientific Writing seminars and Communication Science workshops are provided.

Scientific Events
The PRP office supports the IREC trainees to present their research projects at the IADR/AADR meetings, the Hinman Research Symposium, the Yankee Dental Congress and the annual GSDM Science Day.

Instructions in the Responsible Conduct of Research (RCR)
Prior to Apex training, The PRP office informs the trainees of their responsibilities that include sessions on the CITI Trainings in the Protection of Human Subjects in Research, HIPAA, Good Clinical Practice and Responsible Conduct of Research. The activities include five online modules: Introduction to RCR, Data Management, Mentoring, Plagiarism, and Reproducibility.

Training and Assessment
The research mentor is expected to provide guidance and supervision to the trainee. The mentor formally meets with the IREC trainee on a regular basis to review progress. In addition, the mentor is expected to interact informally with the IREC trainee on a regular basis during the elective course in years two and three. The IREC trainee’s progress is determined by an evaluation questionnaire completed by the research mentor to provide an assessment of the trainee’s degree of research progress and knowledge of the specific subject area. In addition, the IREC trainee’s research experience is evaluated in relation to subsequent research activities and his/her future career plans. A final grade is issued and an assessment summary provides the trainee with a comprehensive overview of his/her performance.

Program Evaluation
Assessment of the educational outcome is used by measuring the initial baseline through a pre-program questionnaire. A post-program questionnaire is used to quantify changes in knowledge, skills and career choices. A feedback gathered through evaluation is documented and used to improve the quality of the Program. The evaluation helps in the adjustment of goals and objectives of the research training to improve the Program outcome.

Intensive Research Elective Course (IREC) Evaluation Criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Research science aptitudes, report writing, research skills, interpersonal/communication skills</td>
<td>50% mentor</td>
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<tr>
<td>Other assignments</td>
<td>30% mentor</td>
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<tr>
<td>Presentations</td>
<td>10% PRP office</td>
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<td>Journal Club &amp; Meeting attendance</td>
<td>10% PRP office</td>
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### GSDM Intensive Research Elective Course (IREC)

**Name of Student:**

**BUID:**

**Mentor:**

- □ IREC 1
- □ IREC 2
- □ IREC 3

#### Student Responsibilities (Syllabus)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date/ Title of Activity</th>
<th>Date/ Title of Activity</th>
<th>Material Delivered to PRP</th>
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<tbody>
<tr>
<td>Approval Form</td>
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<td>Electronic Submission</td>
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<td>Project Outline</td>
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<td>CITI Course Protection of Human Subjects in Research</td>
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<tr>
<td>CITI Course on HIPAA</td>
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<td>Laboratory Safety Training</td>
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<td>Proof of activity</td>
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<tr>
<td>Animal Safety Training</td>
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<td>Proof of activity</td>
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<tr>
<td>Seminars</td>
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<td>Debriefing of at least one seminar relevant to research project</td>
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<tr>
<td>Mini-Courses</td>
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<td>If applicable</td>
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<tr>
<td>Journal Club</td>
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<td>Article critique write up organized by SRG</td>
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<td>Mid-term Meeting</td>
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<td>Schedule a meeting with PRP office mid-way</td>
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<td>Completed Report/ Final Grade</td>
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<td>Copy of graded report by mentor</td>
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<td>Presentation/ Oral or Poster</td>
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<td>Name of event – copy of poster or ppt</td>
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<td>Mentor’s Evaluation</td>
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<td>Sent by mentor</td>
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<td>Student’s Feedback</td>
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<td>Hand in at completion of course</td>
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<td>Time Sheet</td>
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<td>Hand in at completion of course</td>
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8/2019
Assess the student along each of the following areas. Fill-in one response for each item. Use this scale: 5 = Outstanding 4 = Good 3 = Fair 2 = Marginal 1 = Poor
N.B. For Item #8, writing of final report, the maximum number is 15

### Research Scientist Aptitudes

1. Enthusiasm
2. Familiarity with scientific literature
3. Formulation of specific problems and strategies to invest at
4. Design of new experimental approaches
5. Interpretation of data
6. Succinct presentation of results
7. Preparation of abstracts for scientific presentation
8. Writing of final report
9. Responsiveness to critical evaluation

### Research Skills

10. Planning of experiments
11. Technical performance skills
12. Adherence to schedule
13. Precision and accuracy
14. Respect of laboratory rules and regulations

### Interpersonal/Communication Skills

15. Communication with advisor
16. Participation in scientific discussions
17. Receptiveness to new ideas and scientific approaches
18. Cooperation with others

**Comments and Recommendations**

**Overall Grade:** ___
IREC Time Sheet

Name of Student: ____________________________  BUID: ____________________________  Mentor: ____________________________

☐ IREC 1  ☐ IREC 2  ☐ REC 3

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<tr>
<th>Dates</th>
<th>Monday/Hours</th>
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