Program Proposal

A. Basic Information

1. ***Name of the proposed curriculum, major:*** **Biomedical Sciences**

2. ***Name of the degree*****: M.S. and Ph.D. in Biomedical Sciences**

3. ***Name of the departments involved*****: Biomedical Sciences**

4. ***Need for the program***

The Department of Biomedical Sciences seeks to modernize its Graduate Program, and to combine its two existing programs. The new departmental program will replace the existing graduate programs of Biomedical Sciences that offer education in Veterinary Anatomy and in Physiology (and Pharmacology). The combination of two previous programs will allow increased efficiencies and saving of resources. There will be a reduction in the need to advertise and recruit separately for two programs. The proposed departmental program will also compliment and strengthen the Neuroscience Interdepartmental Program that is supported by a number of active research faculty members in the Department of Biomedical Sciences (BMS).

The need for a sound, research based, education of graduates in different areas of specialization of Biomedical Sciences has increased. The graduates are required for employers of individuals trained in life sciences, in human and veterinary health care, industry, federal and state institutions, and academia. Biomedical Science is emerging as an attractive field in many academic institutions nationwide. The National Research Council has recently described the 41% increase in the number of graduate students in medical sciences since 1993 (Nature, 2001,462, 2).

5. ***Objectives of the proposed program including the student learning outcomes***

a. The purpose is to offer advanced research training in up to two of four areas of specialization of Biomedical Sciences at the M.S. level and the Ph.D. level. The areas of specialization shall be: Anatomy, Physiology, Pharmacology, and Cell Biology. The name of the area of specialization shall appear in the official transcript of each graduate in Biomedical Sciences.
b. The graduate students will be trained in advanced biomedical research techniques, interpretation and analysis of research results and the effective written and verbal communication of research findings.
c. The M.S. and Ph.D. students shall be required to demonstrate an advanced and thorough knowledge of their field of study at oral examination. A Ph.D. Preliminary Examination will follow the requirements of the Graduate College Preliminary Examination.
d. The M.S. and Ph.D. students will be required to write a thesis reviewing the knowledge of the field of study, reviewing their experimental results, and interpreting and relating their

observations to the body of knowledge of the field of study. The thesis shall be of good literary standard.

e. The Ph.D. students will be given an opportunity to design and conduct experiments and are expected to publish scientific papers as the first author.
f. The Ph.D. students will be trained and required to complete satisfactorily a research grant proposal that will be reviewed by the POS committee.
g. The Ph.D. students will be encouraged to prepare and present a poster and/or an oral communication to a national or international scientific audience.

6. General description of the program

The M.S. student is expected to finish in less than three years and the Ph.D. student is expected to finish in less than five years. The M.S. is initial research training and a Ph.D. is more extensive research training than the M.S. The Ph.D. degree shall require a minimum of 24 graduate, non-research credits. The M.S. shall require a minimum of 14 graduate non-research credits. A minimum of 72 credits is required for the award of a Ph.D. A minimum of 30 credits is required for the M.S. Graduate students will be encouraged to take core courses in Biochemistry, Statistics, Cell Biology, Literature and Research Review, and Ethics. They will be required to take courses, depending on their area of specialization, in: Anatomy, Cell Biology, Physiology, and Pharmacology. The M.S. and Ph.D. students will conduct research and independently complete a thesis of satisfactory literary and scientific standard. The POS committee will determine the literary and scientific standard of a thesis. The Ph.D. students are expected to publish, or have in press, research papers as major author and complete a research grant proposal. The requirements for Preliminary Examinations shall be those of the Graduate College and include an oral examination. The POS committee may require a written component to the Preliminary Examination.