

**Georgia Institute of Technology
Graduate Curriculum Committee**

**Minutes
May 9, 2013**

Present: Flowers (ARCH), Jagoda (AE), Neitzel (ME), Kvam (ISyE), Breedveld (ChBE), Foley (Coc-IC), Storici (BIOL), Dickson (CHEM)

Visitors: Laros (REG), Weitz (BIOL), Hess (ChBE), Nichols (APPH), Collins (Grad Admissions)

Note: All action items in these minutes require approval by the Academic Senate. In some instances, items may require further approval by the Board of Regents or the University System of Georgia. If the Regents' approval is required, the change is not official until notification is received from the Board to that effect. Academic units should take no action on these items until USG and/or BOR approval is secured. In addition, units should take no action on any of the items below until these minutes have been approved by the Academic Senate or the Executive Board.

Academic Matters

1. A motion was made to approve a request from the School of Chemical and Biomolecular Engineering for a new course. The motion was seconded and approved.

New Course – Approved

CHBE 6001 - Introduction to Research

1-0-1

Note: This course was approved pending modification in the syllabus regarding the grading scheme that the Committee felt was incomplete and needed more explanation.

2. A motion was made to approve a request from the Schools of Applied Physiology, Biology, Chemistry and Biochemistry, Earth and Atmospheric Sciences, Mathematics, Physics, and Psychology for a new degree program prospectus to be submitted to the Board of Regents for review. The motion was seconded and approved.

Prospectus for a New Academic Program – Approved

Doctor of Philosophy with a major in Quantitative BioSciences

OBJECTIVE

Educate the next generation of quantitative bioscientists and advance interdisciplinary research to discover scientific principles underlying the dynamics, structure, and function of living systems.

VISION OF THE PROGRAM

GT's College of Sciences (CoS) has many established and burgeoning leaders focused on global societal challenges in the biological sciences. Bio-focused faculty in CoS span many Schools, are highly collaborative and particularly open to, and experts in, quantitative analysis. However, no PhD program has yet been formed to serve and help expand GT's footprint in the quantitative biosciences. In response, we propose the initiation of the QBioS

PhD program. Research in the QBioS program will be united by: (i) integration of quantitative modeling as a central element of training and research; (ii) a focus on the study of biological systems interacting with their environment. The planned initial themes are: (i) Chemical Biology; (ii) Molecular & Cellular Systems; (iii) Behavior & Physiology; (iv) Ecology; (v) Evolution; (vi) Earth Systems. These themes unite all of Schools within the CoS via a targeted approach to interdisciplinary, multi-scale research challenges, spanning molecules to ecosystems. QBioS will complement existing PhD programs at GT, and faculty involvement from Computing and Engineering will be instrumental in achieving program goals.

NEED FOR THE PROGRAM

Georgia Tech: GT is ranked within the top 10 in most of its engineering programs. Despite many successes, there is a lag in recognition for CoS. The QBioS program will provide increased recognition for BioSciences @ GT, leveraging the strength and recognition of GT as a leader in quantitative research, and coinciding with an ongoing expansion in the life sciences highlighted in GT's strategic plan. This recognition will attract graduate students, facilitate recruitment and retention of faculty, and broaden the core of quantitative biologists interacting with engineering and computing disciplines to leverage scientific discoveries into technological advances.

University System: UGA recently developed a PhD in interdisciplinary biomedical sciences. A complementary need exists for an interdisciplinary PhD that addresses bioscience challenges from a fundamentally quantitative perspective.

State & Southeast Region: There is a growing regional and societal need for scientists to develop principles of how living systems function and interact with their environment, whether in areas of agriculture, biotechnology, energy, health, and sustainability. Scientists trained in QBioS will become leaders in industry, government and academia.

Resources and Timing: GT has a strong cadre of scientific leaders investigating living systems and their interactions with the environment. Multiple training grants are in place, forming a key bottom-up resource to recruit and support students. The development of QBioS will ensure the competitiveness of quantitative bioscience research at GT with respect to current and aspirational peer institutions.

MODEL OF THE PROGRAM

Summary: The program will leverage the programmatic model of the highly successful Bioengineering PhD Program at GT. Students will be admitted with a home school in CoS. Participating faculty can mentor students irrespective of their home school. Program faculty will include members from all Schools in CoS and from CoC and CoE which will strengthen the quantitative core of the program. The research will be driven by student and faculty interest whose scientific aims coincide with the thematic areas designated above, culminating in a PhD in Quantitative BioSciences. New themes will be considered over time.

Administrative structure: QBioS will be led by the program director with day-to-day operations handled by a program manager. Program faculty will participate, on a voluntary basis, on a minimal set of committees, following the Bioengineering model. Advertisement of the program to commence in Fall 2014 with first class of matriculating PhD students in Fall 2015.

Student training: The educational component of the PhD in QBioS will utilize an *a la carte* approach, spanning: (i) the biosciences; (ii) interaction of biosystems and the environment; (iii) quantitative modeling. The emphasis of student training will be in the development of research advances in their home labs. Rotations and qualifying exams will be suited to the individual student.

Adjourned,

Ann Laros for
Reta Pikowsky
Registrar