

**Georgia Institute of Technology**  
**Graduate Curriculum Committee**  
**Minutes**  
**September 1, 2011**

**Present:** Clarke (COM), Pikowsky (Registrar), Storici (BIO), Ferri (ECE), Silva (ECON), Neitzel (ME), Corso (PSYC), Boldyreva (CS), Flowers (ARCH), Goldsman (ISYE), Mazalek (LCC), Paredis (ME),

**Visitors:** Laros (Registrar), Howson (Registrar), Simon (Registrar), Paraska (VPFAD), Stiftel (CRP), Bost (BMED), Jacobs (CoE), Sharp (CoA), Zhu (BMED), Borenstein (PUBP), Gallego (INTA), Benkeser (BMED), Barabino (BMED), Spatt (BMED), Drummond (CP)

**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.

**Administrative Matters**

Dr. Jonathan Clarke was elected Chair for AY 11-12.

Dr. Tom Sanders, MSE, was nominated for the Vice Chair role. Dr. Neitzel volunteered to contact Dr. Sanders, who was not present at the meeting, to inquire about his willingness to serve in this capacity. Following the meeting, Dr. Sanders accepted the role and confirmed his willingness to serve. His election as Vice Chair for AY 11-12 has therefore been finalized.

Reta Pikowsky, Registrar, will continue to serve as Secretary.

The meeting schedule for Thursday at 3:00 PM was approved. The Registrar's Office will provide a meeting schedule and update the web sites.

The members of the Committee thanked Julie Babensee for her excellent leadership and hard work as the past Chair.

**Academic Matters**

1. A motion was made to approve a request by the College of Computing for course equivalencies. The motion was seconded and approved.

The Computational Journalism undergraduate (CS4464) and graduate (CS6465) courses should be considered as equivalent selections. This request is necessary because it was not noted as equivalent on either the undergraduate or graduate new course proposal forms (NCP) submitted in 2008.

The Committee was unclear about some of the details of the requested equivalencies listed below. Dr. Boldyreva volunteered to follow up with the College and clarify the details with the Registrar's Office. **In a subsequent conversation, the College of Computing asked that this request be withdrawn so that it can be properly re-evaluated and re-submitted at a later date.**

CS 7641 (Machine Learning) equivalent to CSE 6740 (Computational Data Analysis)

CS 4400 (Introduction to Database Systems) equivalent to CS 6400 (Database Systems Concepts and Design)

CS 4420 (Database Systems Implementation) equivalent to CS 6400 (Database Systems Concepts and Design)

CS 4420 (Database Systems Implementation) equivalent to CS 6422 (Database Systems Implementation)

CS 6400 (Database Systems Concepts and Design) equivalent to CS 6422 (Database Systems Implementation)

This motion was also approved by the UCC on August 16, 2011.

2. A motion was made to table a request by the College of Computing to change CS 8999 (Doctoral Thesis Prep) from non-repeatable to repeatable. The motion was seconded and approved to **table** this request.

Note: The Committee asked for an explanation of why this is necessary and if there would be a limitation on the number of credit hours that could be accumulated with this course. The concern centered for the most part on why this is needed as a repeatable course.

3. A motion was made to approve a request by the School of International Affairs for a new course. The motion was seconded and approved.

**New Course:**

INTA 6016: Strategy and Arms Control 3-0-3

4. A motion was made to approve a request by the School of City and Regional Planning for a new degree. The motion was seconded and approved.

**New Degree:**

Master of Science in Geographic Information Science and Technology

Geographic information science (GIS) is an emerging field of study centered on the acquisition, management, analysis, and dissemination of information that is spatially-referenced to locations on, above, and below the surface of the earth.

Geographic information science and technology is the academic field of study that serves the emerging geospatial technology industry cluster.

The School will recruit students from three target populations for this program. The first, and initially largest, target population will be current professionals in GIS-related fields with a need or interest in extending their professional expertise in the use of geospatial technologies. The primary targeted occupations will be those that are both large in number and projected to enjoy substantial growth. They include civil engineers, environmental engineers, environmental scientists, logisticians, and urban and regional planners. Perhaps half of these students will be drawn from local, regional, state, and federal government agencies, with the other half coming from private sector consulting firms, software firms, and companies with a special interest in spatial technologies.

The second target population will be undergraduate seniors interested in pursuing a career in the GIS field, with or without a first professional degree, and the third target population will be current Georgia Tech (and other Atlanta-area) graduate students who may want to supplement their primary degree with a second, specialized GIS degree.

The **program of study** for the MS-GIST includes one prerequisite (or one year of equivalent professional experience), six required core courses, a two substantive-area courses from a discipline associated with GIS, two open elective courses, and the Capstone Project course. All core courses are three-hour courses (except for CP 6024 which is four hours), substantive-area courses and electives may be three- or four-hour courses, and the Capstone Project course is a six-hour course. Students can complete the 37 credit-hour curriculum in one calendar year including two semesters of full-time coursework and a capstone project course offered during the summer.

a. Prerequisite Course:

A basic understanding of GIS technology is required as a prerequisite of the degree program. This may be achieved through one of four options:

- 1) CP 4510 Geographic Information Systems (3-0-3) or
- 2) CP 6514 Introduction to Geographic Information Systems (3-0-3) or
- 3) equivalent coursework at another institution (as evaluated by the program coordinator)
- 4) one year of equivalent professional experience (as evaluated by the program coordinator)

b. Core Courses:

The required GIS courses are:

CP 6024 Quantitative and Computer Methods (3-3-4)

CP 6521 Advanced GIS (3-0-3)  
CP 6531 Introduction to Remote Sensing (3-0-3)  
CP 6551 Spatial Analysis of Socioeconomic Data (3-0-3)  
CP 6541 Environmental GIS (3-0-3)  
CP 6542 Transport & GIS (3-0-3)  
CP 6950 Capstone Project (3-9-6) **[pending final approval of course]**

c. Substantive Area Courses:

Because GIS is a transdisciplinary technology, GIST students will be required to take two courses from one of the many GIS-related disciplines. These could include, but are not limited to, courses drawn from civil and environmental engineering, industrial and systems engineering, earth and atmospheric sciences, public policy, management, city planning, and architecture. The substantive area courses must be approved by the program coordinator. Three substantive area examples from the School of City and Regional Planning are given below:

Environment

CP 6214 Environmental Planning (3-0-3)  
CP 6223 Policy Tools for Environmental Management (3-0-3)

Land use

CP 6112 Introduction to Land Use (3-0-3)  
CP 6105 Land Conservation (3-0-3)

Transportation

CP 6311 Introduction to Transportation Planning (3-3-4)  
CP 6321 Transportation Planning and Investment (3-3-4)

d. Free Electives

These courses can be selected by the student and will ordinarily either (1) give extra depth in the student's selected substantive area or (2) provide the student with a second substantive area.

**Note: In a follow-up email vote, the revised proposal for CP 6950 Capstone Project (3-9-6) was approved.**

5. A motion was made to table a request by the School of City and Regional Planning for a new course. The motion was seconded and approved to **table** this request.

Note: There was a long discussion about the 6 hours of credit requested for this course and how the expected mode of presentation was not described consistently with regard to the distribution of credit hours. The Committee asked that the School work with the Registrar's Office to address the changes that are needed on the NCP form to accurately and clearly describe this course. The Committee's

suggestions and concerns will be addressed and the course will be resubmitted at the next GCC meeting.

**New Course:** Tabled

CP 6950: GIS Capstone Project

6-0-6

- A motion was made to approve a request by the School of Public Policy for a new course. The motion was seconded and approved.

**New Course:**

PHIL 6010: Biotechnology and Research Ethics

2-0-2

Note: This course and its content would be in addition to and would provide more in-depth treatment of the subject than is possible through the required ethics training. This course would complement the required ethics training, not replace it or substitute for it.

- A motion was made to approve a request by the Department of Biomedical Engineering for a new degree. The motion was seconded and approved.

**New Degree:**

Master of Biomedical Innovation and Development (Master in Biomedical Innovation and Development was the original title requested which was changed by the Committee during the discussion)

Fall			Spring			Summer		
1st Semester		Hrs	2nd Semester		Hrs	3rd Semester		Hrs
BMED 6501	Medical Design Process	3	BMED 6505	Product Planning & Proj Mgt	3	BMED 6506	Pro Communications	3
BMED 6502	Clinical Experience	3	BMED 6508	MS Clinical Project I	3	BMED 6507	Regulatory (FDA & ISO)	3
BMED 6503	Medical Mkt & Specialities	3		Elective	3	BMED 6509	MS Clinical Project II	6
BMED 6504	Financial Planning for Proj	3		Elective	3			
TOTAL HOURS		12	TOTAL HOURS		12	TOTAL HOURS		12
Legend:	Core			Project			Elective	

Total hours required for degree

**36**

All core courses require a grade of "C" or better.

Applicants must have a bachelor's degree in engineering, science, or other technical field related to design and development. Applicants should have 3.0 overall GPA; 3.25 in their undergraduate major. Additional criteria will include: the applicant's GRE score, submission of a statement of intent, three (3) letters of recommendation, and proficiency in oral and written English. A committee composed of representatives of the BioID program faculty and BME graduate admissions will review applications and admit students to the program. Admissions will be in accordance with the Georgia Institute of Technology Graduate School Statement of Admission Competitiveness.

Graduates of the BioID program will possess an understanding of experience in the complexity and interrelationships required for translating user needs into commercially viable solutions. Students will be exposed to clinical/hospital/clinic environments and interacting with healthcare professionals; engineering, prototyping and evaluation of design solutions; medical device regulatory requirements for design, manufacturing and sales of medical products; and fundamentals of business planning, project financial analysis and justifications.

Specific learning outcomes include:

- a. Graduates will have a strong foundation in biomedical product development.
- b. Ability to identify, formulate and develop solutions for clinical biomedical design problems and opportunities.
- c. Ability to meet the desired project functional and performance requirements along with constraints presented by the client and the “users” during the development and commercialization process.
- d. Working knowledge of financial planning techniques and analysis for engineering and developmental projects.
- e. Ability to work effectively with multiple stakeholders in the medical device development and commercialization process; such as company financial management, functional management for research, development, marketing, FDA and engineering subspecialties.

8. A motion was made to approve a request by the Department of Biomedical Engineering for new courses. The motion was seconded and approved.

Note: There were several corrections and edits that were needed on the NCPs. The Registrar’s Office will work with BMED to clarify, edit as needed, and reload the updated forms as well as the syllabi to the ICC web site. All of these courses were approved with the caveat that the corrections and edits be completed and recorded via new forms updated to the web site. There was discussion at the conclusion of the meeting regarding the 6 hours of credit for BMED 6509 and the need to make sure that the expected mode of presentation and the credit hour explanation are consistent and that the proposal for 6 hours of credit makes sense once the NCP is finalized.

**New Courses:**

BMED 6501: Fundamentals of BioID Process	3-0-3
BMED 6502: Clinical Literacy and Experience	2-3-3
BMED 6503: Medical Markets and Clinical Specialties	3-0-3
BMED 6504: Financial Planning For Projects	3-0-3
BMED 6505: Product Planning and Project Management	3-0-3
BMED 6506: Professional Communications for BioID	3-0-3
BMED 6507: Medical Device Regulatory Requirements	3-0-3
BMED 6508: BioID Team Masters Project I	1-6-3
BMED 6509: BioID Team Masters Project II	2-12-6

**NOTE:** Initially, all of the above courses were to be coded at catalog level as Letter Grade only. Meetings were held on September 8<sup>th</sup> and 9<sup>th</sup> with BMED to follow up on the discussions related to the grading basis, hour breakdown, and expected mode of delivery for the above courses to clarify the questions and concerns addressed at the meeting. In that follow up discussion it was determined that that some of the courses should be approved at the Catalog level for all modes of grading. The updated NCP's and syllabi have been reloaded to the GCC proposal site. The chart below indicates the changes to grade mode options.

BMED 6501: Fundamentals of BioID Process	L, P/F, Audit
BMED 6502: Clinical Literacy and Experience	L, P/F
BMED 6503: Medical Markets and Clinical Specialties	L, P/F, Audit
BMED 6504: Financial Planning For Projects	L, P/F
BMED 6505: Product Planning and Project Management	L, P/F
BMED 6506: Professional Communications for BioID	L, P/F, Audit
BMED 6507: Medical Device Regulatory Requirements	L, P/F, Audit
BMED 6508: BioID Team Masters Project I	L, P/F
BMED 6509: BioID Team Masters Project II	L, P/F

9. A motion was made to approve a request by the Department of Biomedical Engineering for a degree modification. The motion was seconded and approved.

**Degree Modification:**

External, Joint Degree: Doctor of Philosophy with a major in Biomedical Engineering with Peking University and Emory University

At the time the joint program curriculum was established, it was based on the Coulter Department's Ph.D. program in Biomedical Engineering. The curriculum revisions for the GT-Emory BMED Ph.D. degree were approved on March 13, 2008 by the institution's faculty committees. Several courses that are relevant to the joint program were updated and approved on April 14, 2011.

The requested revision to the joint Ph.D. program with Peking University would simply bring its curriculum in line with the Coulter department's currently approved program. The joint GT-Emory-PKU graduate committee agreed to move forward with the revised requirements at their meeting on June 21, 2011. The full faculty of the Coulter department added their unanimous approval of the revision on August 16, 2011.

**Integrative Core** (two 3 hour courses required)

BMED 7011 Integrative Core: Introduction to Modeling and Experimentation in Biomedical Engineering

BMED 7012 Integrative Core: Experimental Design- Experimental Design- Measurements at the Right Spatial and Temporal Scales

**Engineering/Bioscience Fundamentals** (18 hours minimum)

Various courses from BMED and other departments can be used to fulfill this category.

The pre-requisites for the specific Advanced Seminar (below) generally drive the choices. The relevant BMED courses being submitted in this proposal are:

BMED 7040 Introduction to FDA Regulatory Compliance  
BMED 7311 Nanoengineering & Nanomedicine  
BMED 7410 Introduction to Multiscale Analysis in Systems Biology

BMED 7411 Mathematical Models in Biology & Medicine  
BMED 7412 Analysis & Modeling of Complex Biological Systems  
BMED 7413 Biochemical Systems Analysis  
BMED 7610 Quantitative Neuroscience

**Advanced Graduate Seminar** (one 3–5hour course required)

BMED 7101 Advanced Seminar: Biomaterials & Regenerative Medicine  
*BMED 7201 Advanced Seminar: Cardiovascular Biology & Biomechanics*  
*(to be requested in the future after taught as BMED 8813 Special Topics)*  
BMED 7301 Advanced Seminar: Cellular & Biomolecular Engineering  
*BMED 7401 Advanced Seminar: Integrative Biosystems*  
*(to be requested in the future after taught as BMED 8813 Special Topics)*  
BMED 7501 Advanced Seminar: Medical Imaging  
*BMED 7601 Advanced Seminar: Neuroengineering*  
*(to be requested in the future after taught as BMED 8813 Special Topics)*

Additional course requirements include:

**Bioethics/Values in Science (Emory)** (1)

**Teaching Assistantship Series-TATTO (Emory) & TA terms (GT)** (1+1+1)

*BMED 7002 Teaching Assistantship I*  
*(to be requested in the future after taught as BMED 8813 Special Topics)*  
*BMED 7003 Teaching Assistantship II*  
*(to be requested in the future after taught as BMED 8813 Special Topics)*

**BMED Seminar** (4 semesters @ 1 hour/semester)

BMED 7001 Biomedical Engineering Seminar

**9 hour academic minor** (typically met using Eng/Bio Fund's courses)

The resulting total minimum number of required hours is 35. It is anticipated (although not required) that students may take other elective coursework to fulfill the requirements of their individual research projects and/or training grants.

[See chart on next page for proposed study plan.]



DEGREE NAME: Joint Doctor of Philosophy with a major in Biomedical Engineering Program with Peking University and Emory University (PROPOSED)

DEGREE REQUIREMENTS for: August 2011

Complete the following:

- Show Course Type—Examples Prerequisite (PR)  
Required (R)  
Category of Courses (CC)  
Thesis (TH)  
Minor (M)  
Elective (E)  
Track (TR)  
Concentration (CO)  
Project (PJ)
- Show Location the course will be taken/completed: GT-ATL  
GT-SAV  
GT-LORR  
Institution Name
- Show the Modality: Distance Learning (DL)  
Independent Study (IN)  
Classroom (CL)  
Video (V)
- Identify NEW courses as such.

COURSE PREFIX/Nbr

FIRST YEAR - FALL	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
BMED 7001 - BME Seminar	R	1	GT-ATL	CL	1
BMED 8813-IC1 - Integrative Core I	R	3	GT-ATL	CL	3
MSE 6777 - Adv. Biomaterials	E	3	GT-ATL	CL	3
IBS 555 - Basic Biomed & Biol. Sci.	E	6	Emory University	CL	6
					13
FIRST YEAR - SPRING	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
BMED 7001 - BME Seminar	R	1	GT-ATL	CL	1
BMED 6777 - Adv. Biomaterials	E	3	GT-ATL	CL	3
BMED 8813-IC2 - Integrative Core II	R	3	GT-ATL	CL	3
ME 6782 - Cellular Engineering	E	3	GT-ATL	CL	3
					10
FIRST YEAR - SUMMER	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
TATT 500 - TA Training	R	1	Emory University	CL	1
					1
SECOND YEAR - FALL	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
BMED 7001 - BME Seminar	R	1	GT-ATL	CL	1
BMED 8696 - TATTO/TA I	R	1	GT-ATL	CL	1
BMED 8813 - Adv. Seminar - Contemp. Biomaterials	E	3	GT-ATL	CL	3
CHE 5752 - Polymer Characterization	E	4	GT-ATL	CL	4
ME 6782 - Cellular Engineering	E	3	GT-ATL	CL	3
					12
SECOND YEAR - SPRING	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
BMED 7001 - BME Seminar	R	1	GT-ATL	CL	1
BMED 8696 - TATTO/TA II	R	1	GT-ATL	CL	1
IBS 506 - Values In Science	R	1	Emory University	CL	1
MGT 6198 - Corp. Entrepreneurship	R	3	GT-ATL	CL	3
					6
SECOND YEAR - SUMMER	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
					0
THIRD YEAR - FALL	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
Global Perspectives	R	3	Peking University	CL	3
					3

PhD	THIRD YEAR - SPRING	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
						0
						0
	THIRD YEAR - SUMMER	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
						0
						0
	FOURTH YEAR - FALL	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
						0
						0
	FOURTH YEAR - SPRING	COURSE TYPE	COURSE HRS	LOCATION	MODALITY	TOTAL SEM HRS
						0
						0
Sub-total						45
International Work, Internship, or Research Experience						0
						0
Sub-total of Other						0
<b>TOTAL</b>						<b>45</b>

**Note: The total number of credits required for this program is 42. There was confusing information included in the charts. The School reviewed all of the material and corrected the total credits to 42.**

### Student Petitions

1. A motion was made to approve a written appeal of a petition to allow a grade change from an F to a C from the Fall 2009 term. The motion was seconded and approved.
2. A motion was made to maintain the tabled status of a petition requesting a late selective from a class in Spring 2011 which the student says he did not attend. The motion was seconded and approved. The petition will remain tabled until a better clarification from the instructor can be obtained.
3. A motion was made, via an email vote following the meeting, to approve Subcommittee actions on petitions in the following areas. The motion was seconded and approved.

All were approved by the subcommittee except as noted:

- 1 Change grade mode (current term)
- 1 Extend withdrawal deadline (registration issue)
- 3 Selective withdrawals (1 Denied)
- 1 Late grade change (1 Denied)
- 2 Term withdrawals (1 Denied)
- 1 Waive registration requirement (1 Denied)

The following petitions were handled Administratively by the Registrar's office. All are approved except where noted.

4 Readmit after first dismissal

1 Use excess pass/fail hours

29 Change standing from special to degree seeking

2 Use 9000 level hours as 7000 level hours to meet M.S. degree requirements

1 Use transient class towards degree

1 Waive GPA requirement (School)

1 Change CRN for CEE8901 (revise registration)

3 Seven-year rule waivers

3 Six-year rule waivers

1 Count CS8900 as repeatable (change repeat flags in Banner to address registration error)

1 Three-year rule waiver

1 Return Fall 2011

1 Use BIOL2344 and 2355 as lab science (for pre-req)

1 Waive one hour credit requirement

1 Cancel Summer registration (1 Denied)

1 Waive last term of enrollment (reinstate waiver previously granted - special case)

Adjourned,

Reta Pikowsky  
Registrar