

**Institute Undergraduate Curriculum Committee  
Appeals and Academic Matters (Full Committee)  
Tuesday, February 8, 2011**

**Present:** Riley (ECE), Montoya (BIOL), Seitzman (AE), Loss (MATH), Senf (LCC), Isbell (CoC), Hollengreen (ARCH), Stein (Dean of Students), Castro-Lacouture (ARCH), Walker (PSYC), Chang (MGT), Belton (ECON)

**Visitors:** Laros (REG), Howson (REG), Paraska (VPFAD), Simon (REG), Hicks (PUBP), Parsons (MGT), Goodisman (BIOL), Mihail (CoC), Wynens (LEP)

**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 Public Policy and the College of Management for a new minor. The motion was seconded and approved.

**NEW MINOR:** Leadership Studies

The Minor in Leadership Studies has as its primary objective the goal of providing students with an in-depth knowledge of leadership theory, skills, experience, and application through a rigorous program of study that is multi-disciplinary in nature. Initially, the minor will be comprised of two tracks-- one in Public Policy and the second in Management-- offered through the School of Public Policy and the ILE respectively. In the second year of offering, a third track will be launched to focus on global leadership and intercultural awareness. This third track will involve additional academic units within the Ivan Allen College and College of Sciences at Georgia Tech. The total number of hours in the minor will be 15. In order for a student to be enrolled in this minor, they must have at least 30 credit hours with a cumulative GPA of 2.5 or greater, applied for admission, and been formally admitted. Each course counting toward the minor must be completed with a grade of C or above, with the overall required GPA in the courses counting toward the minor being a 2.75 or better.

Required Course:      3 semester credit hours  
Track:                    9 semester credit hours. Choose one--Public Policy or Management.  
   [3<sup>rd</sup> Track modification to be requested in 2012]  
Internship:              3 semester hours

A. Each student must take the following course (3 hours):

PUBP 4140 - Foundations of Leadership

B. Each student must take at least three courses selected from either the Policy track or the Management track in the following list of offerings (9 hours). The Foundations of Leadership course is a required course for completion of the Minor.

Policy Track

PUBP 2030 - Organizations and Policy

PST 3050 – Political Philosophy

PUBP 2010 - Political Processes

PUBP 4803 – Public Leadership

Management Track

MGT 3150 – Principles of Management

MGT 4191 - Entrepreneurship Forum

MGT 4192 - Impact Forum

MGT 4193 - Servant Leadership, Values and Systems

MGT 4194 - Social Entrepreneurship

MGT3103 - Leadership-Changing Environments

MGT4670 - Entrepreneurship

MGT/ME4741 - Integrative Development-Project Preparation

MGT4803 – Managing Teams

C. Internship. Each student must complete an internship from either the Policy track or the Management track (3 hours).

MGT4611 – Integrative Management Analysis

PUBP 4651 - Internship

Total Semester Hours for Minor: 15 (5 courses)

Student outcomes: 1) enhancing their knowledge of leadership theory and practice in public or private sector settings, 2) improving their critical thinking and social capacity to manage leadership challenges, and 3) strengthening their ability to design and implement leadership solutions that are responsive to an increasingly complex and diverse world.

A request was made that this minor be a degree designator and be printed on the diploma. The Committee explained that minors are printed on the transcript not on the diplomas.

**NOTE: There was some discussion of the relatively small number of elective courses in the Public Policy track. Public Policy indicated that it will be working to flesh out the options so that students have more choices for those nine credit hours.**

2. A motion was made to approve a request from the School of Biology for a degree modification, new courses, and course deactivations. The motion was seconded and approved.

**DEGREE MODIFICATION:** Bachelor of Science in Biology

Change requirements for the Biology major to permit students who have previously taken BIOL 3340 and BIOL 3341 to receive credit for these classes while allowing BIOL 3450 and BIOL 3451 to count for students who take these classes in the future.

The School of Biology has approved the name changes of two courses that currently make up the Biology major and wishes to rename and renumber the following two courses:

1. BIOL 3340 'Cell Biology' to BIOL 3450 'Cell and Molecular Biology'
2. BIOL 3341 'Cell Biology Lab' to BIOL 3451 'Cell and Molecular Biology Lab'

The rationale for the name changes is that the new names will help express the course content to hiring entities outside of Georgia Tech and permit our students to get recognition for material they have learned. No change in course content is anticipated as the Cell Biology courses have always necessarily included extensive discussion of molecular biology.

The specific reason for the name change request originates from the fact that some of our students were deemed ineligible for positions at the Georgia Bureau of Investigation because they had not taken a course with the words 'Molecular Biology' in the title, even though many of the courses they had taken here at Georgia Tech, including Cell Biology, had extensive discussion of molecular biology.

In an email dated Nov 9, 2010, Ted Staples, Manager of Forensic Biology at the GBI, stated "All government forensic DNA labs in the country have to abide by those requirements known as the DNA Quality Assurance Standards. The requirement for an analyst is: 5.4.1 Minimum educational requirements: The analyst shall have ... completed course work (graduate or undergraduate level) covering the following subject areas: biochemistry, genetics, molecular biology...." The GBI has taken this to mean that individuals who have not taken a course with the specific words 'molecular biology' in the title are ineligible for the position. Staples went on to state "I think Cell and Molecular Biology would be title I would recommend".

Thus, overall, changing the name of the Cell Biology courses will benefit our students and give them the credit they deserve for material they have learned.

**NEW COURSES:**

BIOL 3450: Cell and Molecular Biology 3-0-3

BIOL 3451: Cell and Molecular Biology Lab 0-3-1

BIOL 4480: Evolutionary Developmental Biology – How to Build an Organism 2-0-2

The Committee made reference to the proposed graduate equivalent of this course and asked if both course numbers should fall within the range reserved for cross-listings (X740-X799).

The numbers reserved for cross-listings apply to courses that are cross-listed with other schools and/or departments, and not graduate/undergraduate joint-listings. Therefore, the BIOL 4480 number can be used for this course.

**DEACTIVATE COURSE:**

BIOL 3340 and BIOL 3341

3. A motion was made to approve a request from the College of Management for a new course. The motion was seconded and approved

**NEW COURSE:**

MGT 4068: Fixed Income 3-0-3

The Syllabus and the NCP had different prerequisites listed for MGT 4068. The prerequisites on the NCP were correct and the Syllabus loaded to the IUCC site will be corrected to match the NCP. The correct prerequisites were MGT 3062 or MGT 3078.

4. A motion was made to approve a request from the College of Computing for new courses, degree modifications, and to review prerequisite changes. The motion was seconded and approved and no objections or concerns were recorded for the prerequisite changes.

**PREREQUISITE MODIFICATIONS:**

- **CS 3451:**

ADD CS1332 and CS2340 as a prerequisite to CS3451

The addition of these prerequisites will allow students to be well versed in object-oriented programming before they take graphics which requires solid object oriented programming skills. These new prerequisites are in addition to the current prerequisites of (CS 2110 or CS 2261) and MATH 2605

- **CS 3510 and 3511:**

REMOVE CS1050, CS1331 and MATH3012 as prerequisites from CS3510 Design and Analysis of Algorithms (and its equivalent CS3511 Honors Design and Analysis of Algorithms)

ADD CS2050 or 2051 as a prerequisite for CS3510 and 3511

JUSTIFICATION: In general, the prerequisite for CS3510 is some combination of (i) exposure to algorithms and (ii) background in discrete mathematics. The Theory and Discrete Mathematics faculty are in agreement that the exact amounts of (i) and (ii) are not fixed, and above a certain minimum level, (i) and (ii) trade-off. At the same time, the Theory and Discrete Mathematics faculty are in agreement that a student may enter CS3510/11 from either (a) A computer science perspective or a mathematics perspective. In the case where a student enters CS3510/11 from a computer science perspective,

CS2050/51 provides sufficient background in discrete mathematics. In the case where a student enters CS3510/11 from a mathematics perspective, CS2050/51 provides sufficient algorithmic exposure.

ADD “One of CS1332 or MATH3012” as a prerequisite for CS3510 and 3511.

JUSTIFICATION: In general, the prerequisites for CS3510 are some combination of (a) exposure to algorithms and (b) background in discrete mathematics. The exact amounts of (a) and (b) are not fixed, and above a certain minimum level, (a) and (b) trade-off. At the same time, the students may enter CS3510/11 from either a computer science perspective or a mathematics perspective. In the case where a student enters CS3510/11 from a computer science perspective, CS1332 combined with CS2050/51 provide strong algorithmic exposure. In the case where a student enters CS3510/11 from a mathematics perspective, MATH 3012 combined with CS2050/51 provide strong background in discrete mathematics. The above is consensus of Theory and Discrete Mathematics faculty.

- **CS 4510:**

REMOVE CS1050, CS1331, and MATH3012 as prerequisites from CS4510 Automata and Computation

ADD CS 3510/3511 as a prerequisite for CS4510

JUSTIFICATION: In general, the prerequisites for CS4510 are strong algorithmic theory background, and mathematical maturity. The Theory faculty is in consensus that the current requirements do not provide sufficient strength in required algorithmic theory background, and that even the combination CS2050/51, CS1331 and MATH3012 would not provide sufficient strength in required algorithmic theory background. Such an algorithmic theory background will be provided by CS3510/11 Design and Analysis of Algorithms, which we propose as the sole new requirement for CS4510. Concerning mathematical maturity which was ensured by the CS1050 and MATH3012 requirements: CS1050 is deleted from the requirements and replaced by CS2050/51. The Theory faculty is in consensus that CS2050/51 and CS3510/11 (which has CS2050/51 as a prerequisite) provide comparable mathematical maturity. Therefore placing CS3510/11 as the sole prerequisite for CS4510 allows us to drop all of CS1050, CS1331, and MATH3012 from the list of prerequisites for CS4510.. In addition having CS3510/11 as a sole prerequisite for both CS4510 and CS4540 also provides a solid transition in a student’s matriculation (CS3510/11 is already the sole prerequisite for CS4540 in the catalog).

## NEW COURSES:

CS 2050: Introduction to Discrete Mathematics for Computer Science	3-0-3
CS 2051: Honors - Introduction to Discrete Mathematics for Computer Science	3-0-3

These courses are listed as L/G, P/F, and Audit at catalog level. CS 1050 will be added to the NCP as an equivalent course to both CS 2050 and 2051.

NOTE: Dr. Loss posed the question whether the Discrete Mathematics program – which requires CS 1050 – had been notified of the pending changes. Dr. Isbell informed the committee that there had been numerous emails and conversations between the two programs, and that Discrete Mathematics was indeed aware.

**DEGREE MODIFICATION:** Bachelor of Science in Computer Science

**Intelligence Thread:**

ADD CS4649 Robot Intelligence: Planning to the Knowledge-Based Intelligence Free Elective Cluster group for the Intelligence Thread. CS4649 is a new course that depth and breadth to the Intelligence Thread.

ADD CS4731 Game AI to the mandatory “Approaches to Intelligence Pick 2 group” within the Intelligence Thread, which will add an additional course selection to the Pick. This broadens the spectrum of courses to take within the Thread and it also allows for an additional gaming course within the thread. This will allow students to explore gaming within a mandatory Pick 2 and free up a free elective

**Platform Thread:**

ADD CS4240 Compilers, Interpreters, and Program Analyzers to the “Platforms Interfaces Pick course listing”. The course gives an additional course option for students in the “Platforms Interfaces Pick listing.

**Devices Thread:**

ADD CS4649 Robot Intelligence: Planning to the Intelligent Systems Free Elective Pick group for the Devices Thread. CS4649 is a new course that was added to the Devices thread to add depth and breadth and robotics course as a free elective within the Devices Thread

**People Thread:**

REPLACE PSYC 3011 Cognitive Psychology with PSYC 3012 Cognitive Psychology for Non Majors in the “Human Cognition and Interaction” Elective course cluster. This change is as a direct result of a change in the Psychology department decision to make a course for non-majors. As result, non-majors can no longer take PSYC 3011.

**Media Thread:**

ADD the following courses to the “Media Technologies Pick List ”  
CS4460 Information Visualization  
CS4464 Computational Journalism  
CS4475 Computational Photography

Adding additional courses to this pick will give students more flexibility in course offering by allowing them to use some of these courses for mandatory pick instead of their free elective. Also, these courses to the pick will allow for these courses to be offered on a regular basis because they satisfy a mandatory pick.

**Media & People:**

Media & People are creating a new Media Architecture a Pick 1 category where CS2110 and CS2261 are the pick options.

#### Intelligence & Media/Media & Theory:

CS 2110 and CS 2261 were once equivalent selections, so within the Media Thread a student could take either CS2110 or CS2261 to fulfill the course requirement; however, the two courses are no longer equivalent selections so the Intelligence & Media and Media & Theory combinations need to be changed in the catalog 8 terms to indicate that CS2110 is required and CS2261 is no longer an option.

#### Theory Thread:

Computing made several changes to the Theory Thread and those changes are shown in the course outline below by the additions in red and deletions marked through.

### Required Courses.

#### Fundamentals in Programming ~~Programming~~, Mathematics and Theoretical Computer Science

- ~~• CS 1171 Introductory Computing in Matlab, 1~~
- CS 1301 Introduction to Computing and Programming, 3
- CS 1331 Introduction to Object-Oriented Programming, 3
- CS 1332 Data Structures and Algorithms, 3
- **CS 2050 or 2051\* Introduction to Discrete Mathematics for Computer Science, 3**
- CS 2110 Computing Organization and Programming, 4
- CS 2340 Objects and Design, 3
- **CS 4510 Automata and Complexity Theory, 3**
- CS 4540 Advanced Algorithms, 3
- **MATH 2406 Abstract Vector Spaces, 3 (Requires MATH 1502 or MATH 1512)**

*\*2051 is Honors version of 2050*

#### ~~Pick 1 of Introduction to Proofs for Computer Science:~~

- ~~• CS 1050 Understanding and Constructing Proofs, 3~~
- ~~• CS 1050X Understanding and Constructing Proofs, Honors, 3~~

#### Pick 1 of Introduction to Algorithms:

- CS 3510 Design and Analysis of Algorithms, 3
- CS 3511 Design and Analysis of Algorithms, Honors, 3

#### ~~Pick 1 of Computational Complexity:~~

- ~~• CS 3240 Languages and Computation, 3~~
- ~~• CS 4510 Automata and Complexity Theory, 3~~

#### Mathematics

- ~~Pick 1 of Mathematics related to Computer Science~~
- ~~MATH 2406 Abstract Vector Spaces, 3 (Requires MATH 1502 or MATH 1512)~~
- ~~MATH 4032 Combinatorial Analysis, 3 (Requires MATH 3012)~~

### Pick 1 of Advanced Mathematics

- MATH 4022 Introduction to Graph Theory, 3
- MATH 4032 Combinatorial Analysis, 3 (Requires MATH 3012)
- MATH 4150 Introduction to Number Theory, 3

Elective Courses (pick and choose whatever courses you wish)

Free Electives (9 hours)

- FREE-FND1 Free Elective-Foundations, 3
- FREE-FND2 Free Elective-Foundations, 3
- FREE-FND3 Free Elective-Foundations, 3

Topics in Algorithms and Complexity

- CS 3240 Languages and Computation, 3
- CS 4510 Automata and Complexity Theory, 3
- CS 6520 Computational Complexity, 3 (Prereq CS 3510 or 3511)
- CS 4520 Approximation Algorithms, 3 (Prereq CS 3510 or 3511)
- CS 4530 Randomized Algorithms, 3 (Prereq CS 3510 or 3511)

Mathematics with Computer Science Applications

- ~~MATH 2406 Abstract Vector Spaces, 3 (Requires MATH 1502 or MATH 1512)~~
- MATH 4022 Introduction to Graph Theory, 3
- MATH 4150 Introduction to Number Theory and Cryptography, 3 (Requires MATH 2406)
- MATH 4107 Abstract Algebra I, 3 (Requires MATH 2406)
- MATH 4255 Monte Carlo Methods, 3 (Requires MATH 3215 or MATH 3225 or MATH 3770)
- MATH 4280 Introduction to Information Theory, 3 (Requires MATH 3215 or MATH 3225)
- MATH 4305 Topics in Linear Algebra, 3 (Requires MATH 1502 or MATH 1512 or MATH 1522)
- MATH 4580 Linear Programming, 3 (Requires MATH 1502 or MATH 1512)
- MATH 4640 Numerical Analysis I, 3 (Requires MATH 2403 or MATH 2413 or MATH 2602)
- MATH 4782 Quantum Information and Quantum Computation, 3
- MATH 3770 Statistics and Applications, 3 (Requires MATH 2401 or 2411. Cross-listed with ISYE and CE)
- MATH 4012 Algebraic Structures for Coding Theory, 3 (Requires MATH 1502 or 1512)



## Examples of Computer Science Applications involving Algorithms and Complexity

- CS 3251 Computer Networking I, 3
- CS 4400 Introduction to Database Systems, 3
- CS 4235 Introduction to Information Security, 3
- CS 3210 Design of Operating Systems, 3
- CS 3451 Computer Graphics, 3 (Must come after MATH 2605 and 2110 or 2260)
- CS 4496 Computer Animation, 3
- CS 3600 Introduction to Artificial Intelligence, 3
- CS 4641 Machine Learning, 3
- CS 4140 Computational Modeling Algorithms, 3
- CS 4335 Modeling and Simulation: Fundamentals and Implementation, 3

## Computational Methods in the Sciences

- ~~BIOL 2400 Mathematical Models in Biology, 3 (Requires MATH 1502 or MATH 1512)~~
- ~~BIOL 4755 Mathematical Biology, 3 (Requires CS 1301 and BIOL 3332 and MATH 1502)~~
- ~~PHYS 3151 Mathematical Physics, 3 (Requires MATH 2403 and PHYS 2212)~~
- ~~PHYS 3266 Computational Physics, 4 (Requires PHYS 2212)~~
- ~~ISYE 3133 Optimization (Requires CS 1322 and Math 2602)~~
- ~~MGT 3076 Investments, 3 (Requires MGT 3062)~~
- ~~MGT 3078 Finance and Investments, 3~~
- ~~MGT 3084 Derivative Securities, 3 (Requires MGT 3062 or MGT 3078)~~
- ~~ECON 3110 Advanced Microeconomic Analysis, 3 (Requires ECON 2100 or ECON 2105 and ECON 2106)~~
- ~~ECON 3120 Advanced Macroeconomic Analysis, 3 (Requires ECON 2100 or ECON 2105 and ECON 2106)~~

The above changes will decrease the number of Free Electives by two hours in all of the eight-terms that Theory is one of the Threads.

## Theory & Platforms

Previously, the Threads combination of Theory and Platforms used the same course, CS 3240, to fulfill a Platform requirement and to fulfill the Theory Complexity Pick. With the above change of deleting the Complexity Pick and making CS 4510 the required course, students taking the Theory and Platform combination will have to take both courses to fulfill the requirements of both threads. This change will, therefore, decrease the number of free electives in the Theory and Platform eight-term by an additional 3 hours.

## Course Modifications:

CS 2110 and CS 2261 were once considered equivalent selections; however, CS has determined that these two courses are not equivalent. Therefore, the course catalog will be changed to indicate that the courses are not equivalent and students can get credit for both courses. This change will take effect Spring 2011.

Background: this should have been done last year, when CS changed the prerequisite for CS 2200. At the April 20<sup>th</sup>, 2010 meeting, CoC requested that the prereq for CS 2200 be changed from “CS 2110 or CS 2261” to “CS 2110” only. The reason for this change was because the faculty felt that CS 2110 and CS 2261 were not really equivalent courses and that CS 2261 didn’t adequately prepare students for CS 2200 , but that wasn’t specified and the request wasn’t made then to make the courses non-equivalent.

CS has identified at least two students who took the courses since the time they intended to make them non-equivalent and wants these students to receive academic credit for both courses. The Committee approved that these students be allowed to count both CS 2110 and 2261 for credit. The Registrar’s Office and CS will work together to identify and award the credit for these students.

Adjourned,

Robert Simon for  
Reta Pikowsky  
Registrar