

**Request for Authorization
to offer the existing
Biological Science Major
on the Griffin Campus**

Institution: The University of Georgia
Date: August 26, 2004
School: College of Agricultural and Environmental Sciences
Departments: AAEC, CRSS, ENTO, FDST, HORT, PATH
Name of Program: Biological Science
Degree: Bachelor of Science in Agriculture (B.S.A.)
Major: Biological Science
CIP Code:
Starting Date: Fall 2005

Signatures:

_____	_____
Dean of the College	Date
_____	_____
Department Head	Date

Program Abstract

Text for recommendation to Board of Regents by President Adams

Program description and objectives

The College of Agricultural and Environmental Sciences (CAES) is seeking authorization to offer a program of undergraduate courses on The University of Georgia (UGA) extended campus at Griffin. The undergraduate program will lead to a Bachelor of Science in Agriculture (B.S.A) degree with a major in Biological Science. The program will be offered as a “2+2” program in cooperation with Gordon College. The Bachelor of Science in Agriculture (B.S.A) degree and the Biological Science major are an existing degree and major, and are currently offered in Athens.

The rationale for offering this program on the UGA Griffin Campus is to 1) provide an inter-disciplinary program that will train students in biological science using the most recent developments in agricultural sciences, such as biotechnology, plant genetics and integrated pest management, 2) provide students with educational opportunities to benefit from practical experiences that can be provided by the research environment of the UGA Griffin Campus, and 3) provide the opportunity for students to receive a UGA undergraduate degree in south metro Atlanta and middle Georgia, particularly African-American and Hispanic students.

An additional reason that makes the undergraduate academic program desirable on the Griffin Campus is the ability to capitalize on the exiting infrastructure at both Gordon College and the UGA Griffin Campus. The University of Georgia Griffin Campus was established in 1888 and is now a world renowned research facility. The original 123 acre campus now consists of 80+ buildings that total 378,000 sq. ft., a graduate level library, a unique Envirotron, rain shelter facilities for controlled environmental studies, 1000+ acres of research land, and numerous greenhouses. The 40+ faculty and 280+ support staff are heavily engaged in research, graduate education, and to a lesser extent, undergraduate education with other institutions of higher learning in the region (e.g., Gordon College, Mercer University, and Griffin Technical College). The CAES faculty propose that offering academic courses at the undergraduate level on the Griffin Campus will strengthen the campus and the educational opportunities of the region.

Gordon College is located 20 miles south of the UGA Griffin Campus. It has been a two year college of the University System of Georgia since 1972. Gordon College has an enrollment of 3,500+ students and offers an Associate of Arts degree with a choice of 12 majors and an Associate of Science degree with a choice of 27 majors. Majors offered at Gordon College that are relevant to this proposal and that are eligible for the University System of Georgia transfer program include: Agricultural and Environmental Sciences, Biological Sciences, Forestry, and Horticulture. It is anticipated that the initial enrollment of undergraduate students in the fall of 2005 will be 20 - 30 students. Student interest surveys and anecdotal evidence indicate that the numbers would rise dramatically over time.

The University of Georgia Griffin Campus is already considered an economic engine and a major contributor to the academic, professional, and intellectual growth in the region. The addition of the undergraduate teaching program is expected to increase its contributions to the region’s vitality, workforce professional development, and economy.

This fact is recognized by the leadership of both the city of Griffin and Spalding County and the leaders in the local business community (Appendix A). Indeed, the city and county have currently included \$4 million in their Special Purpose Local Option Sales Tax (SPLOST) proposal to help provide classroom space for growing University of Georgia baccalaureate degree program on the Griffin Campus and to demonstrate their commitment to this program and to higher education in the region.

Offering an undergraduate degree at the Griffin Campus will require the equivalent of three full-time teaching faculty, one academic professional, one administrative assistant, and a one half- time lab teaching assistant. The budget for each faculty is about \$100,000 for salary and benefits. In addition, \$10,000 for each (E.F.T.) will be needed annually to allow for replacement of equipment, materials and supplies. Initially, the teaching faculty will need a start-up budget of approximately \$30,000 for classroom, laboratory, and greenhouse instruction equipment and supplies. Funds in the amount of \$140,000 have been appropriated in the FY05 budget to help facilitate the initiation of the teaching program. Total program needs on an annual basis are expected to be \$560,000.

The CAES 2003 Strategic Plan specifically identified “the initiation of the undergraduate program at Griffin in conjunction with Gordon College” as a key action item in its new goal to “embrace the state as a classroom.” And, the plan’s timeline calls for implementation of the program during 2004-2005. Thus, the priority of this program has been clearly identified. This strategic directive, combined with the University System of Georgia’s long-standing aspiration to promote “sharing physical, human, information, and other resources in collaboration with other System institutions...”, make the proposed collaboration of The University of Georgia and Gordon College a timely action that can enhance student and faculty diversity and promote the economic and educational opportunities for the citizens of south metro Atlanta and middle Georgia.

Justification and need for the program

1. Societal need for graduates

The CAES-Biological Science major provides a flexible program of study that prepares students for graduate and professional study and for careers in business, industry, and government. A biological science major is a perfect fit for students interested in biology, biochemistry, chemistry, molecular biology, genetics, microbiology, cellular biology, and/or ecology. The Griffin Campus program will emphasize biological science as it relates to environmental and urban agricultural issues. According to the Georgia Department of Labor, Workforce Information and Analysis Division, the demand for educated workers in careers related to the biological sciences are expected to increase between 30-50% by 2010. Specifically, the demand for workers educated at the Doctoral degree level as Biological Scientists and Wildlife Biologists are expected to increase 30% by 2010. According to the National Association of Colleges and Employers, beginning salary offers in 2003 averaged \$29,456 a year for bachelor’s degree recipients in biological and life sciences: \$33,600 for master’s degree recipients and \$42,244 for doctoral degree recipients.

2. Student demand for the program in the region served

A survey of 375 students at Gordon College that were enrolled in science classes during the spring semester was conducted in May of 2004. Results of the survey indicate that 72% were interested in obtaining an undergraduate degree from The University of Georgia if the junior and senior years were offered at the Griffin Campus. Of the 72% that indicated a positive interest, 49% (133 total individuals) indicated that they would be interested in pursuing a Bachelor of Science in Agriculture (B.S.A.) degree with a major in Biological Science. Ninety-one students indicated that they would be interested in enrolling in a Biological Science program for the Fall 2005 semester (Appendix B). According to the UGA 2001, 2002 and 2003 Fact Book statistics, Gordon College consistently ranks between 10th and 12th of the 50+ colleges and universities from which undergraduate students transfer to The University of Georgia.

A similar student interest survey was conducted during the spring semester of 2004 at two of the largest high schools in the area surrounding the Griffin Campus. Survey results at Spalding High School indicate that 71% of the 715 students that responded were interested in obtaining an undergraduate degree from The University of Georgia if the junior and senior years were offered at the Griffin Campus and the freshman and sophomore years were offered at Gordon College or another qualified transfer institution. Of the total 715 students surveyed, 36% indicated they would be interested in pursuing a Bachelor of Science in Agriculture (B.S.A.) degree with a major in Biological Science (Appendix C).

The results of the survey conducted at Griffin High School were very similar. Of the 800 student respondents, 68% indicated they were interested in obtaining an undergraduate degree from The University of Georgia if the junior and senior years were offered at the Griffin Campus and the freshman and sophomore years were offered at Gordon College or another qualified transfer institution. Forty-six percent indicated they would be interested in pursuing a Bachelor of Science in Agriculture (B.S.A.) degree with a major in Biological Science (Appendix D).

The results of these college-level and high school surveys indicate a remarkably strong demand for The University of Georgia to offer an undergraduate degree on the Griffin Campus in conjunction with Gordon College. And, an equally remarkably large interest appears to exist for pursuing the Bachelor of Science in Agriculture (B.S.A.) degree with a major in Biological Science.

3. Additional reasons that make the program desirable

Offering a University of Georgia Bachelor of Science in Agriculture (B.S.A.) degree with a major in Biological Science on the Griffin campus affords students a unique opportunity to combine classroom, research, and work experiences. In addition to having close proximity to the faculty that are associated with teaching, the Griffin Campus undergraduate students will have access to faculty from the USDA Plant Genetic Resources Conservation Unit (PGRUCU), the Center for Food Safety, the Food

Product Innovation and Commercialization Center, and the Georgia Center for Urban Agriculture. Over the past 20+ years hundreds of Gordon College students have been employed as part-time student workers and summer workers in these programs on the Griffin Campus. With the launch of the undergraduate program, priority for employment could be given to students enrolled in the CAES degree program. This opportunity would give the students valuable work experience and a closer association with the faculty. Although only a very small percentage of the faculty are needed to launch the undergraduate academic program, the proximity of the undergraduate students to the other faculty on the Griffin Campus has great potential in the area of student research and mentoring.

To determine the interest in teaching undergraduate courses on the Griffin Campus, a survey was conducted of the entire faculty. Of the 27 respondents, 78% indicated that they would be willing to teach or team-teach a course. Thirty-eight percent preferred to teach the entire class and 62% indicated they would prefer to co-teach. Fifty-eight percent indicated that they would be willing to advise or mentor an undergraduate student (Appendix E).

An additional reason that makes the undergraduate academic program desirable on the Griffin Campus is that the Campus is uniquely suited to meet the needs of students in south metro and central Georgia. It is fully expected that offering academic programs at the Griffin Campus will attract minorities, particularly African-American and Hispanic students that are now under represented and under served by The University of Georgia. Nearly four million Georgians reside within the counties in a 50-mile radius of the Griffin Campus. Of that total, 28% are African-American and 3% are Hispanic, according to the 2001 Georgia County Guide.

Public and private institutions in the state offering similar programs

There are no University System four-year institutions in the area bounded by Clayton College and State University, Columbus State University, State University of West Georgia, and Georgia College and State University. Further, these institutions do not offer the academic opportunities proposed for the Griffin Campus. Thus, a wide area of non-competing opportunities exists for University of Georgia academic programming in this part of the state. The closest post-secondary institution offering junior and senior level courses in the sciences related to agriculture is Fort Valley State University (FVSU). Fort Valley State University, College of Agriculture, Home Economics and Allied Programs is located 75 miles south of the Griffin Campus and offers majors in Agricultural Economics, Agriculture Education, Animal Science, Agricultural Engineering Technology, Ornamental Horticulture, and Plant Science. The proposed UGA program contains aspects that would be complementary to the FVSU program, and the possibility for joint enrollment has been discussed by both the Griffin faculty and the Griffin administration. While the target audience for the Griffin program is primarily within the 50-mile radius of the campus, there may be potential for partnership with FVSU.

Procedures used to develop the program.

Date	Procedure
June 2002	University of Georgia System Chancellor Thomas Meredith visited the Griffin community and the Griffin Campus and discussed the possibilities for undergraduate teaching. He indicated that he is strongly supportive of partnerships between system institutions.
July 2002	Gordon College President Dr. Larry Weill indicated interest in pursuing a 2+2 undergraduate partnership with CAES, similar to the Tifton Campus model.
November 2002- Present	Dr. Knauff, Associate Dean for CAES Academic Programs, met with Griffin Campus faculty and discussed the procedures and options for launching an undergraduate program.
June 2003	Dr. Jeff Jordan is identified as faculty coordinator for the Griffin Campus teaching program.
June 2003	Dr. Jordan is appointed to the CAES curriculum committee and chairs the newly formed Griffin Campus Curriculum Committee. The committee has a representative from each academic department.
August 2003- present	Curriculum committee meets regularly to develop a curriculum that will be relevant to area students and capitalizes on the teaching and research strengths of the faculty.
November 2003	Annie Hunt Burriss (Governor's office) and Tom Daniel (Board of Regents) visit the Griffin Campus and meet with community leaders concerning the "2 + 2" CAES baccalaureate degree program on the Griffin Campus.
February 2004	<p>Dr. Arkin meets with President of Clayton College and State University Dr. Tom Harden for a briefing on the plans for the Griffin Campus "2 + 2" program.</p> <p>Drs. Arkin, Weill and Harden attend a joint luncheon to discuss plans for the "2+2" program. They agree to meet quarterly or on an as needed basis for continued planning purposes.</p>

May 2004	<p>Student surveys are conducted in area high schools and Gordon College to determine interest in proposed majors and areas of interest.</p> <p>Faculty survey conducted to determine interest in teaching proposed undergraduate courses.</p>
August 2004	<p>Proposal for offering the existing CAES Biological Science major at the Griffin Campus in cooperation with Gordon College is submitted to the CAES and UGA Curriculum Committees.</p> <p>Dr. Jerry W. Johnson is appointed as faculty coordinator for the Griffin Campus teaching program and is appointed to the CAES curriculum committee.</p>

Curriculum

BIOLOGICAL SCIENCE (B.S.A.)

Semester Degree Requirements

Entrance Requirements for the Major

Semester Core Curriculum

(Selected with the advice of an academic advisor)

Areas [A](#) [B](#) [C](#) [D](#) [E](#) 42 hours

Area [F](#) 18 hours

Major Requirements 60 hours

College-wide requirements must be satisfied in order to graduate with this major

TOTAL DEGREE HOURS 120

Area A - Essential Skills (9 hours)

Area A is satisfied by students completing nine hours from the following list. Students must take [ENGL 1101](#) and [ENGL 1102](#) and will select a three-hour math course in consultation with an academic advisor.

[ENGL 1101](#)

[MATH 1113](#)

[ENGL 1102](#)

Area B - Institutional Options (4-5 hours)

Area B is satisfied by electives selected by the student with approval of an academic advisor.

Area C - Humanities/Fine Arts (6 hours)

PREFERRED COURSE: [SPCM 1100](#) or [SPCM 1500](#) - (take under general electives if not taken in Area C).

Area C is satisfied by completing two of the following courses. Students may select one course from the Fine Arts list and one from the Humanities list, or students may select two courses from different departments in the Humanities list.

Fine Arts

[ARHI 2100](#)

[DANC 2010](#)

[DRAM 2130](#)

[MUSI 2060](#)

[ARTS 2000](#)

[DRAM 2000](#)

[MUSI 2020](#)

[MUSI 2080](#)

[ARTS 2050](#)

[DRAM 2120](#)

[MUSI 2040](#)

Humanities

[CLAS 1000](#)

[CMLT 2500](#)

[ITAL 2500](#)

[RELI 1006](#)

[CLAS 1010](#)

[EDES 2510](#)

[LING 2100](#)

[RELI 2004](#)

[CLAS 1020](#)

[EDES 2520](#)

[PHIL 1000](#)

[RELI\(AFAM\) 2005](#)

[CLAS\(LING\) 2010](#)

[ENGL 2310](#)

[PHIL 1500](#)

[ROML 2550](#)

[CMLT 2111](#)

[ENGL 2320](#)

[PHIL 2200](#)

[RUSS 2050](#)

[CMLT 2210](#)

[ENGL 2330](#)

[PHIL 2400](#)

[SPCM 1100](#)

[CMLT 2212](#)

[ENGL 2340](#)

[RELI 1001](#)

[SPCM 1500](#)

[CMLT 2220](#)

[ENGL 2400](#)

[RELI 1002](#)

[Foreign language courses](#)

Area D - Science, Mathematics, and Technology (10-11 hours)

PREFERRED COURSES: [BIOL 1107-1107L](#), ([CHEM 1211](#), [CHEM 1211L](#)), and ([MATH 2200](#), [MATH 2200L](#)) - (take under general electives if not taken in Area D).

Area D for Science Majors -- ten or eleven hours

- Select two courses from the four-hour science course list.
- Select one course from the mathematics, science, or technology course list.

Area D -- Four-hour science course with laboratory

ASTR 1010	CHEM 1211L	CSCI 1301-1301L	GEOL 1260-1260L
ASTR 1010L	CHEM 1212	ECOL 1000-1000L	MARS 1010-1010L
ASTR 1020	CHEM 1212L	GEOG 1111	MARS 1020-1020L
ASTR 1020L	CHEM 1411	GEOG 1111L	PBIO 1210
BIOL 1103	CHEM 1411L	GEOG 1112	PBIO 1210L
BIOL 1103L	CHEM 1412	GEOG 1112L	PBIO 1220
BIOL 1104	CHEM 1412L	GEOG 1113	PBIO 1220L
BIOL 1104L	CHEM 2100	GEOG 1113L	PHYS 1111-1111L
BIOL 1107-1107L	CHEM 2100L	GEOL 1121	PHYS 1112-1112L
BIOL 1108-1108L	CHEM 2211	GEOL 1121L	PHYS 1211-1211L
CHEM 1110	CHEM 2211L	GEOL 1122	PHYS 1212-1212L
CHEM 1110L	CHEM 2212	GEOL 1122L	
CHEM 1211	CHEM 2212L	GEOL 1250-1250L	

Area D -- Three or four-hour mathematics, science, or technology courses

BIOL 1108-1108L	CSCI 1301-1301L	MATH 2210	PHYS 1111-1111L
CHEM 1212	MATH 1060	MATH 2210L	PHYS 1112-1112L
CHEM 1212L	MATH 1113	PBIO 1220	STAT 2000
CSCI 1100-1100L	MATH 2200	PBIO 1220L	STAT 2210
CSCI 1210	MATH 2200L	PHIL 2500	

Area E - Social Sciences (12 hours)

Students will select four courses from at least two departments from the list below: (Students who have not met the Georgia and U.S. Constitution requirement by examination should enroll in POLS 1101.)

(A passing grade on an examination on the history of the United States and Georgia is required to satisfy the [United States and Georgia History Requirement](#) for all persons receiving a baccalaureate degree from the University, unless exempted by one of the following courses: [HIST 2111](#), [HIST 2112](#). Examinations are given to freshmen during orientation and twice each semester by the History Department. Reexamination is permitted. Examination dates are announced in the *Schedule of Classes*.)

<u>AAEC 2580</u>	<u>GEOG 1101</u>	<u>HIST 2302</u>	<u>SOCI 2600</u>
<u>AFAM 2000</u>	<u>GEOG 1103</u>	<u>HIST(AFST) 2501</u>	<u>SOCI(AFAM) 2020</u>
<u>ANTH 1102</u>	<u>GEOG 1125</u>	<u>HIST 2502</u>	<u>SOCI(AFAM) 2820</u>
<u>ANTH 2310</u>	<u>HIST 2051</u>	<u>HIST 2601</u>	<u>SPCM 1010</u>
<u>CLAS(ANTH) 2000</u>	<u>HIST(AFST) 2052</u>	<u>HIST 2602</u>	<u>WMST 1110-1110D</u>
<u>ECON 2100</u>	<u>HIST 2111</u>	<u>HIST 2701</u>	<u>WMST 2010</u>
<u>ECON 2105</u>	<u>HIST 2112</u>	<u>HIST 2702</u>	
<u>ECON 2106</u>	<u>HIST 2221</u>	<u>POLS 1101</u>	
<u>ECON 2200</u>	<u>HIST 2222</u>	<u>PSYC 1101</u>	
<u>EDES 1500</u>	<u>HIST 2301</u>	<u>SOCI 1101</u>	

Area F - Courses Related to Major (18 hours)

[BIOL 1108-1108L](#)
[CHEM 1212](#)
[CHEM 1212L](#)
[CHEM 2211](#)
[CHEM 2211L](#)
[CHEM 2212](#)
[CHEM 2212L](#)
[PHYS 1111-1111L](#)

Entrance Requirements

Completion of Core Areas A-E.

Major Requirements

A baccalaureate degree program must require at least 21 semester hours of upper division courses in the major field and at least 39 semester hours of upper division work overall.

Required Courses - 22-26 hours

[BCMB\(BIOL\)\(CHEM\) 3100](#)
[GENE\(BIOL\) 3200](#) or [PGEN 3580](#)
[MIBO 3500](#)

Select six to seven hours from the following:

<u>BIOL 3700</u>	<u>CRSS 4040</u>
<u>CBIO(BIOL) 3300</u>	<u>ENTO (BCMB) 4200</u>
<u>CBIO(BIOL) 3400</u>	<u>GENE (BIOL)3500</u>
<u>CBIO(BIOL) 3800</u>	<u>MIBO 4700/6700</u>
<u>CBIO(MIBO) 4100/6100</u>	<u>VPHY 3100</u>
<u>CBIO 4730/6730</u>	

Select six to eight hours from the following:

[ADSC 3300](#)

[ADSC 3310-3310L](#)

[ADSC 3400-3400L](#)

[BIOL 3110L](#)

[CBIO 3000-3000L](#)

[CBIO\(BIOL\) 3410L](#)

[ECOL 3260-3260L](#)

[ECOL\(BIOL\) 3500-3500L](#)

[ECOL\(BIOL\) 3510](#)

[ENTO 3740-3740L](#)

[MARS 3450-3450L](#)

[MIBO 3510L](#)

[PATH 3530-3530L](#)

[POUL 3750](#)

[POUL 3800-3800L](#)

[POUL 4060/6060](#)

[POUL 4330/6330](#)

Major Electives - 19 hours

[PHYS 1112-1112L](#)

Fifteen hours of upper division courses in the College of Agricultural and Environmental Sciences

General Electives - 15-19 hours

Upper division (0-2 hours)

Any level (0-19 hours)

Total hours required 120

CAES Upper Division Courses available via distance learning or on the Griffin Campus

AAEC 3040 – Agribusiness Marketing (3h)

AAEC 3060 – Principles of Resource Economics (3h)**

AAEC 3100 – Food and Fiber Marketing (3h)

AAEC 3300 – Agribusiness Accounting

AAEC 3400 – Introduction to Agricultural Policy (3h)

AAEC 3610 – Applied Econometrics (3h)

AAEC 3690-3690L – Agribusiness Finance (4h)

AAEC 3980 – Introduction to Agribusiness Management (3h)*

AAEC 4650 – Environmental Economics (3h)

AAEC 4800/6800 – Water Resource Economics (3h)*

AESC 4950 – Special Problems in Agricultural and Environmental Sciences (1-3h)

AESC 4960 – Undergraduate Research in Agricultural and Environmental Sciences (2-6h)

CRSS 3060-3060L – Soils and Hydrology (4h)

CRSS 3270-3270L – Principles of Turfgrass Management (3h)*

CRSS (ENTO)(PATH) 3500 – Turfgrass Pest Management (3h)*

CRSS 4040/6040 - Plant Breeding (3h)

CRSS 4090 – Advanced Turfgrass Science (3h)*

CRSS 4170-6170(and L) – Hydrology, Geology and Soils in Georgia (3h)
CRSS 4340 – Weed Science (3h)*

EHSC (FDST)(MIBO) 4310/6310-4310L/6310L – Environmental Microbiology (3h)

ENTO 3740-3740L – Insect Pest Management (4h)
ENTO 4000-4000L – General Entomology (3h)
ENTO (BCMB) (BTEC) 4200 –Biotechnology (3h)
ENTO 4250-4250L – Pesticide Management and Utilization (3h)
ENTO (PATH) 4360 – Ornamental Pest Management (3h)
ENTO (4400/6400) – Insect Behavior (3h)
ENTO 4500-4500L – Biological Control of Pests (3h)
ENTO (CRSS)(PATH) 4740/6740-4740L/6740L – Integrated Pest Management (3h)

HORT 4090 - Landscape Management (3h)*
HORT 4440/6440-4440L/6440L – Environmental Physiology in Horticulture (3h)
HORT 4990-4990D – Environmental Issues in Horticulture (1h)

PATH 3530-3530L- Introduction to Plant Pathology (3h)
PGEN 3580 – Plant Genetics (3h)

* Available via independent and distance learning

** Satisfies the CAES Cultural Diversity Requirement

Gordon College 2-year Curriculum

Fall Semester, Year 1			Spring Semester, Year 1		
Composition I	ENGL 1101	3	Composition II	ENGL 1102	3
Pre-calculus	MATH 1113	4	Calculus I	MATH 1501	4
Principles of Chemistry I	CHEM 1211K	4	Principles of Chemistry II	CHEM 1212K	4
Principles of Biology I	BIOL 1107K	4	American History I *	HIST 2111	3
Physical Education Activity Course		1	Physical Education	PHED 1101 or 1010	3
		16			17
Fall Semester, Year 2			Spring Semester, Year 2		
Principles of Biology II	BIOL 1108K	4	Principles of Microecon. *	ECON 2106	3
Organic Chemistry I	CHEM 2401K	4	Organic Chemistry II	CHEM 2402K	4
American History II *	HIST 2112	3	Fund. of Public Speaking	COMM 1100	3
Introductory Physics I	PHYS 1111K	4	Area E Course		3
			Area C Course		3
		15			16

* Or other Area E elective

UGA, Griffin Campus Biological Sciences Major

Fall Semester, Year 3			Spring Semester, Year 3		
Intro. Biochemistry & Molecular Biology	BCMB 3100	4	Principles of Genetics	PGEN 3580	3
Intro. Plant Path.	PATH 3530-3530L	3	Intro. to Microbiology	MIBO 3500	3
Insect Pest Mgmt.	ENTO 3740-3740L	4	Major Elective		4
Major Elective		3	Major Elective		3
General Elective		3	General Elective		3
		17			16

Fall Semester, Year 4			Spring Semester, Year 4		
Biotechnology	ENTO 4200	3	Plant Breeding	CRSS 4040	3
Major Elective		3	Major Elective		3
Major Elective		3	General Elective		3
General Elective		3	General Elective		3
General Elective		3			
		15			12

Inventory of Griffin faculty directly involved the Biological Science major.

Dept.	Faculty Member	Rank	Courses
AAEC	Stanley Fletcher	Prof.	AAEC 3040, AAEC 3100, AAEC 3400, AAEC 3610, AAEC 4960
AAEC	Wojciech Florkowski	Prof.	AAEC 3300-Agribusiness Accounting AAEC 3690-3690L-Agribusiness Finance
AAEC	Jeff Jordan	Prof.	AAEC 3060-Principles of Resource Economics AAEC 4650-Environmental Economics
CRSS.	Jerry Johnson	Prof.	PGEN 3580-Principles of Genetics (Team with Jenkins)
CRSS	Gil Landry	Prof.	CRSS 3270-3270-L Turfgrass Management
CRSS	Tim Murphy	Prof.	CRSS (ENTO) (PATH) 3500-Turfgrass Pest Management
CRSS	Paul Raymer	Prof.	CRSS 4040-Plant Breeding
CRSS	Larry Shuman	Prof.	CRSS 3060-3060L-Soils and Hydrology CRSS 4170/6170-4170L/6170L-Hydrology, Geology and Soils in Georgia
ENTO	Kris Braman	Prof.	ENTO 3820-3820L-Forest Protection Entomology ENTO 4360-Ornamental Pest Management ENTO 4400/6400-Insect Behavior ENTO 4500-4500L-Biological Control of Pest
ENTO	David Buntin	Prof.	ENTO 3740 -3740 Insect Pest Management

ENTO	Wayne Gardner	Prof.	ENTO 4000-4000L-General Entomology
ENTO	Tracy Jenkins	Faculty	PGEN 3580-Principles of Genetics (Team with Johnson) ENTO 4200/6200-Biotechnology
ENTO	Ron Oetting	Prof.	ENTO 4250-4250L-Pesticide Management and Utilization
FDST	Jinru Chen	Prof.	MIBO 3500-Introductory Microbiology
FDST	Marilyn Erickson	Assoc. Prof.	FDST 4310/6310-Environmental Microbiology
FDST	Robert Phillips	Prof.	BCMB 3100-Introductory Biochemistry and Molecular Biology (Team with Erickson)
HORT	Orville Lindstrom	Prof.	HORT 4440/6440-4440L/6440L-Environmental Physiology in Horticulture HORT 4990-4990D-Environmental Issues in Horticulture
PATH	James Buck	Asst. Prof.	PATH 3530-3530L-Introductory Plant Pathology
Gordon	Allen Gahr	Assoc. Prof.	Gordon College Faculty
Gordon	Mark Salata	Asst. Prof.	Gordon College Faculty
Gordon	Theresa Stanley	Assoc. Prof	Gordon College Faculty

Outstanding programs of this nature at other institutions

1. The UGA-Tifton Campus program - <http://www.dogsgonesouth.org/>

The University of Georgia, College of Agricultural and Environmental Sciences launched a new major at the Tifton Campus in fall of 2003, and became the second site in the state to offer a UGA undergraduate program off the Athens campus. The Tifton Program is offered as a “2+2” program in cooperation with Abraham Baldwin College. The objectives of the Tifton program are to 1) offer a unique, cross-disciplinary program to train students in the most recent developments in agricultural sciences, such as biotechnology, precision agriculture, integrated pest management, and computer/digital applications to agricultural problems, 2) provide students with educational opportunities to benefit from practical experiences that can be provided by the research and extension environment of The University of Georgia Tifton Campus, and by the real-life situations available in southern Georgia, and 3) provide the opportunity for students to receive a UGA undergraduate degree in the southern part of the state of Georgia.

2. University of Florida satellite campuses-Ft. Lauderdale, Ft. Pierce, Milton, and Apopka. [Donn Shilling, formerly with Mid-Florida Research & Education Center, Binion Rd., Apopka, FL 32703-8504]

The College of Agricultural and Life Sciences at the University of Florida offers undergraduate and graduate degrees in agricultural majors at four satellite locations around the state. These programs are perhaps the most closely related to ours, in terms of cooperation between the main campus and two-year institutions, and involvement of off-campus faculty in teaching. Students at the University of Florida can receive degrees at satellite campuses in five areas: Turfgrass, Natural Resource Conservation, Nursery Management and Ornamental Horticulture, Agricultural Business Management, and Urban Entomology, without relocating to the main campus in Gainesville. Currently, there are 400 students enrolled in their satellite programs. The curricula involve both face-to-face and distance education formats, and complement course offerings from nearby two-year institutions. Student demographics are similar between the satellite and main campuses, with slightly more non-traditional, “place bound” students at the satellite locations. The satellite programs offer the College of Agricultural and Life Sciences room for expansion despite the current cap on enrollment imposed at UF-Gainesville.

3. The UGA-Gwinnett Center program – <http://www.gactr.uga.edu/gwinnett/>

In 2000, The University of Georgia expanded to its first off-campus, degree awarding institution, the Gwinnett Center. This is a joint program between Georgia Perimeter College and UGA that currently offers a number of graduate degree programs, including the CAES-based Masters of Food Technology. Thus, the proposed Griffin program would not be the first UGA degree offered outside of Athens, but is a logical progression of UGA’s desire to build on existing strengths at all UGA facilities. The Gwinnett Center should provide the model for many of the logistical considerations for delivering UGA degree programs outside of Athens, in conjunction with other systems institutions.

4. Joint Animal Science programs between Washington State University and University of Idaho. [John Froseth or Chris Holstetler, WSU Swine Center, PO Box 646351, Pullman, WA 99164-6351]

The campuses of Washington State University and University of Idaho are approximately eight miles apart. For years, they have collaborated in several areas, and currently cross-list about 800 courses. In particular, WSU provides a complete swine education and research program that it shares with Idaho, and likewise, Idaho provides shared research and education programs for sheep. The content of our program differs, but the collaborative effort between the two institutions is somewhat similar to the relationship between Gordon and UGA in the Griffin program. In the WSU-UI example, students do not change institutions mid-way through their program as in our program, but rather commute back and forth during their 4-year program. This program provides an excellent model for the institutional framework associated with joint programs.

5. Montana State University program in Agricultural Operations Technology. [Clay Marlow, Assoc. Dean, College of Agriculture, Montana State University, Bozeman, MT 59717]

In 1998, MSU announced that it would be offering a joint 4-year Bachelor of Science degree in Agricultural Operations Technology between MSU-Bozeman and MSU-Northern. The program integrates applied and scientific course content in agricultural technology from two institutions in the state. The program is designed so that course offerings at the two campuses “complement rather than compete with each other.” However, their program utilizes distance learning technology to handle much of the collaboration, thus lacks the predominantly face-to-face, hands-on instruction of our program. Enrollment in MSU’s Agricultural Operations Technology major fluctuates between 30-40.

Inventory of pertinent library resources

The CAES Griffin Campus Library, a branch of The University of Georgia Libraries, houses a representative collection of books and journals to support graduate-level research in the areas of agricultural and applied economics, biological and agricultural engineering, crop and soil science, entomology, food science and technology, horticulture, and plant genetic resources conservation. The library is located on the first floor of the Stuckey Building. The library contains over 300 subscriptions to periodicals, over 10,000 catalogued books, on-line access to all Elsevier, Kluwer, Blackwell and Wiley Journals, the GIL on-line catalog, the GALILEO on-line databases, and document delivery service. Publications from the UGA Cooperative Extension Service and Experiment Stations are also available and are free to the public. Two staff members provide assistance and five computers, four printers, a copier and fax machine are available for students.

The Gordon College Library provides material to supplement students’ work in the classroom and the laboratory. The library also provides material for recreational reading and for the pursuit of special interests. The library is an open-shelf library with the books arranged according to the Library of Congress classification system. Students are encouraged to browse, to read while in the library, and to check out books. The library provides access to the collection through an on-line catalog, Voyager System, which is used by all of the University System schools.

Currently, the regular collection includes approximately 80,000 books. In addition to this collection, students have access to a variety of valuable reference tools. The library subscribes to more than 125 periodicals, with the back issues of many of these bound or on microfilm. Current coverage of local, state, regional, national, and international events is provided by a number of newspapers in the library and by NEWSBANK, and electronic database. Galileo (Georgia Library Learning Online), another electronic resource, provides access to full-text journal and magazine database, the Internet, and many online catalogs.

As a member of the regional group of cooperating libraries, the Gordon College library makes its facilities and collection available to other academic institutions. In return, Gordon College students have access to the resources of many other colleges, special, and public libraries. As the learning resources center for Gordon College, the library combines traditional library services with modern educational technology. In addition to books and periodicals, the library houses a growing collection of audiovisual materials, films, video-tapes, record, slides, and maps that are available for student use in the Library. record players, cassette players and recorders, microfilm and microfiche reader-printers, film projectors, computers, and CD-ROM reference materials are also available in the library.

Gordon students may use self-service, coin-operated photocopiers and microfilm copiers located in the library. Computer-generated articles from GALILEO and the Internet and word processed papers may be printed on a laser printer for a nominal charge.

Qualifications of the students who will be recruited and admitted to the proposed program.

Transfer students from Gordon College, as well as other System and non–System institutions, must meet The University of Georgia, CAES admissions requirements in order to participate in the program. Students seeking to take courses offered at the Griffin Campus as transient students must meet The University of Georgia’s established rules and regulations regarding transient students.

Facilities

Classroom, laboratory, and library facilities are available at both the Griffin Campus and the Gordon College. The primary teaching facility at the UGA Griffin Campus is the Stuckey Conference Center. There are five classrooms that can accommodate class sizes of 12 to 44 students. A 300-seat auditorium can be used for classes of up to 120 students. A conference room with GSAMS capability can seat 24 students. There is nearly 1,100 sq. ft. of unused space in the Stuckey Building. Also available is a conference room in the Flynt Building to seat between 14 and 38 people and an outdoor pavilion for various activities. The following is a description of their facilities:

1. Stuckey Conference Center, Room 199 (approximately 314 sq. ft. of space); 12 as a conference setup; 12-16 as a classroom setup; 20 as a theater setup.
2. Stuckey Conference Center, Room 143 (approximately 264 sq. ft. of space); 12 as a conference setup; 12 as a classroom setup; 16 as a theater setup.
3. Stuckey Conference Center, Room 201 (approximately 741 sq. ft. of space and GSAMS technology); 18 as a conference setup; 48 with perimeter seating; 36 as a classroom setup; 48 as a theater setup.

4. Stuckey Conference Center, Room 202 (approximately 853 sq. ft. of space); 44 as a classroom setup; 54 as a theater setup. If this room is divided into two rooms:
 - a. Stuckey Conference Center, Room 202 A (approximately 400 sq. ft. of space); 16 as a conference setup; 20 as a classroom setup; 30 as a theater setup.
 - b. Stuckey Conference Center, Room 202 B (approximately 468 sq. ft. of space); 20 as a conference setup; 24 as a classroom setup; 34 as a theater setup.
5. Stuckey Conference Center Auditorium (approximately 3,440 sq. ft. of space); 50 as a conference setup; 120 as a classroom setup; 300 as a theater setup; 300 as a banquet setup.
6. Flynt Conference Building, Conference Room (approximately 485 sq. ft. of space); 14 as a conference setup; 38 with perimeter seating.
7. Stuckey Conference Center, Room 130-132, formerly the Business Office (approximately 1,088 sq. ft. of space); currently office space, bookstore space, vault space. This space is not being used as classroom space at this time.
8. Chapman-Woodruff Pavilion (approximately 4,594 sq. ft. of total space; 1,804 sq. ft. of "center" space); 84 in dining space using round tables; 84-150 in dining space using round and 6; rectangular tables; 150 as a theater set-up.

Laboratory Space

With some minor renovations, existing laboratories in the Redding Building can be used as teaching laboratories. Each laboratory is about 20 ft. wide and ranges from about 21 to 25 ft. long. The laboratories have side benches and center benches and would accommodate 10 to 12 students each. They also have air, vacuum and gas lines, sinks, and fume hoods. They have safety equipment including eye washes, emergency showers, and spill packs. In addition, there is a post-harvest systems laboratory with space for new laboratories. Students will also have access to space in the Instructional Complex at Gordon College. The Instructional Complex houses the entire Mathematics and Natural Sciences Division, includes computer services, 30 multimedia classrooms, four computer classrooms, two lecture halls, a computer center or student use, and laboratories for the Natural Sciences. The first floor contains two lecture halls, four computer classrooms, four multimedia classrooms, and the computer center for student use. The second floor contains 10 multimedia classrooms and a Physics/Astronomy lab. The third floor contains eight multimedia classrooms and four biology labs. The fourth floor contains eight multimedia classrooms and four chemistry labs.

Technology

The existing Griffin Campus technological resources for instruction include:

Microcomputer Laboratory – Flynt Building, room 121

- Eight microcomputer mini-tower systems
- Microsoft Windows XP operating system
- Microsoft Office XP
- All systems are behind an active hardware firewall for security

Computers for possible loan – OIT Athens

- 35 laptops, on an as-available basis
- combination of Microsoft Windows XP and Windows 98
- Microsoft Office XP

Georgia Statewide Academic & Medical System (GSAMS) – Stuckey Building, Rm. 201

- Direct-linked video-conferencing (VTC) system to over 100+ existing systems Statewide
- VTC system is bridge-linked to points beyond State of Georgia boundaries via Georgia Technology Authority facilities in Atlanta (\$75/hour)

Satellite downlink – Stuckey Building, room 201

- Wire-mesh, 8-foot diameter dish, roof mounted
- Analog signal for both C and Ku/H bands
- Digital signals (only when weather is appropriate)

Wiring for Continuing Education facilities – Stuckey Building

- All conferencing rooms (Auditorium, rooms 119, 114, 201, 200/202) are category-5 wired for computer data drops
- Auditorium and room 200/202 can receive satellite downlink
- Full wiring (multiple data drops) for rooms 114 and 200/202
- Fiber optic cabling available in Naomi Chapman-Woodruff Pavilion for use as data connection

Additional Needs required for Instructional programs

- 'Solid' satellite dish for better digital reception
- Larger pool of microcomputers for classroom instruction
- DHCP (providing Dynamic IP) addressing Campus-wide
- Wireless access within Stuckey Conference Center
- Additional data LCD display systems, permanently mounted
- Adherence to recent UGA policies on computer access for persons with disabilities
- ½ EFT employee to handle instructional computer support

Administration

Program Administration

The CAES Biological Science major will be administered through the Associate Dean for Academic Affairs, as are all other undergraduate majors in CAES. Local administration will be under the direction of the Assistant Dean of the Griffin Campus. The major will have an undergraduate faculty coordinator on campus that will provide day-to-day management of the program, and the support of an academic Program Specialist, who will report to the Assistant Dean. The undergraduate coordinator will be based in an academic department within CAES, but will have liaison responsibilities to all department heads with faculty in the program.

Program Support

The UGA Office of Instructional Support and Development will provide Griffin-based faculty with intensive workshops in course development and classroom instruction prior to the implementation of the major. Interactions will continue after the program has begun.

Assessment

Individual course offerings will be assessed with standardized end-of-term evaluations by students, peer-review of teaching, and student interviews. Student evaluations will be obtained each semester, while peer-review and student interviews will be obtained on a periodic basis.

Accreditation

No additional requirements necessary

Affirmative Action impact

It is fully expected that offering academic programs at the Griffin Campus will attract minorities, particularly African-American and Hispanic students that are now under represented and under served by The University of Georgia. Nearly four million Georgians reside within the counties in a 50-mile radius of the Griffin Campus. Of that total, 28% are African-American and 3% are Hispanic, according to the 2001 Georgia County Guide. Also, the partnership with Gordon College is expected to dramatically enhance the minority enrollment of CAES. The minority enrollment of freshmen at Gordon College was 25+% in Fall 2002.

Degree inscription

Bachelor of Science in Agriculture **(B.S.A.)**

List of Appendices

Appendix A

Letters of Support from:

Dr. Larry Weill, President, Gordon College
Dr. J. Puett, Department Head of Biochemistry, UGA
Dr. Duncan C. Krause, Department Head of Microbiology, UGA
Spalding County Board of Commissioners
Griffin Spalding Chamber of Commerce
Griffin-Spalding Partners in Education
Griffin Spalding County School System

Appendix B

Gordon College Student Survey and Results

Appendix C

Spalding High School Student Survey and Results

Appendix D

Griffin High School Student Survey and Results

Appendix E

Griffin Faculty Survey and Results

Appendix F

Course Descriptions

Appendix G

Faculty Vitas on CD

Appendix B

Gordon College Student Results

**Student Survey
Evaluating the Potential of a Degree Program
between
Gordon College and The University of Georgia,
College of Agricultural and Environmental Sciences,
Griffin Campus
Spring 2004**

1. Would you be interested in obtaining an undergraduate degree from The University of Georgia if the junior and senior years were offered on the Griffin Campus and the freshman and sophomore years were offered at Gordon College?

a. Yes **268**

b. No **107**

2. Would you be interested in an undergraduate degree leading to a **Bachelor of Science in Agriculture (B.S.A.)**, in **Biological Sciences** if it were offered by The University of Georgia on the Griffin Campus?

a. Yes **133**

b. No **135**

3. Which of the following areas in the Biological Sciences appeal to you?

a. Environmental Resource Sciences **24**

b. General Biological Sciences **75**

c. Entomology **8**

d. Plant Sciences **5**

e. Turfgrass Management **4**

4. In which semester would you be interested in enrolling in a proposed program at the Griffin Campus?

a. Fall 2005 **91**

b. Spring 2006 **11**

c. Summer 2006 **7**

d. Fall 2006 **16**

Appendix C

Spalding High School Results

**High School Student Survey
Evaluating the Potential of a Degree Program
at The University of Georgia,
College of Agricultural and Environmental Sciences,
Griffin Campus
May 2004**

1. Would you be interested in obtaining an undergraduate degree from The University of Georgia if the junior and senior years were offered on the Griffin Campus and the freshman and sophomore years were offered at Gordon College or another qualified transfer institution?
 - a. Yes **510**
 - b. No **205**

2. Would you be interested in an undergraduate degree leading to a **Bachelor of Science in Agriculture (B.S.A.)**, in **Biological Sciences** if it were offered by The University of Georgia on the Griffin Campus?
 - a. Yes **252**
 - b. No **450**

3. Which of the following areas in the Biological Sciences appeal to you?
 - a. Environmental Resource Sciences **211**
 - b. General Biological Sciences **224**
 - c. Entomology **63**
 - d. Plant Sciences **136**
 - e. Turfgrass Management **83**

4. When do you expect to graduate from High School?
 - a. Spring 2004 **115**
 - b. Spring 2005 **210**
 - c. Spring 2006 **88**
 - d. Spring 2007 **165**

5. Your comments about the proposed undergraduate program.

Appendix D

Griffin High School Results

**High School Student Survey
Evaluating the Potential of a Degree Program
at The University of Georgia,
College of Agricultural and Environmental Sciences,
Griffin Campus
May 2004**

4. Would you be interested in obtaining an undergraduate degree from The University of Georgia if the junior and senior years were offered on the Griffin Campus and the freshman and sophomore years were offered at Gordon College or another qualified transfer institution?

a. Yes **543**
b. No **257**

5. Would you be interested in an undergraduate degree leading to a **Bachelor of Science in Agriculture (B.S.A.)**, in **Biological Sciences** if it were offered by The University of Georgia on the Griffin Campus?

a. Yes **367**
b. No **438**

6. Which of the following areas in the Biological Sciences appeal to you?

a. Environmental Resource Sciences **260**
b. General Biological Sciences **280**
c. Entomology **64**
d. Plant Sciences **127**
e. Turfgrass Management **59**

4. When do you expect to graduate from High School?

e. Spring 2004 **43**
f. Spring 2005 **223**
g. Spring 2006 **248**
h. Spring 2007 **318**

5. Your comments about the proposed undergraduate program.

Appendix E

**Griffin Campus
Potential Teaching Faculty Survey
May 2004**

1. Would you be willing to teach or co-teach a course in the Griffin Campus based CAES- Biological Sciences Major? (Attached is the tentative list of courses for the Environmental Resource Sciences area of emphasis. Other existing courses within your department could be taught as electives.)

A. Yes **21**
B. No **6**

2. Would you prefer to teach all or only part of a course?

A. All **8**
B. Part **13**

3. Would your course have a laboratory?

A. Yes **13**
B. No **7**

4. What resources other than a classroom space (or laboratory) would be required to teach the course? (check all that apply)

Teaching Assistant **5**
Computer/overhead projection system **17**
Library resources beyond those currently available **6**
Distance Education facilities (e.g. GSAMS, WebCT) **6**
Computer Lab for students **7**
Vehicle for field trips **8**
Greenhouse or farm space **2**
Annual supply budget, including lab supplies
Specify \$ / course/ semester _____
Specialized equipment _____
Other (please list)

5. How much preparation time would be required prior to teaching the course?

A. <4 months **6** C. 8-12 months **3**
B. 4-8 months **11** D. >12 months **1**

Appendix E continued

6. Which semester or time of year would be best for teaching given the demands of the course and your other responsibilities? (Dates are for the 2005 and 2006 academic years, they may vary approximate, +/- 1 week in future years. They represent class time only, not final exams or registration periods.)

Fall Semester (18 Aug - 9 Dec)	16
Spring Semester (10 Jan - 2 May)	10
Maymester (17 May - 7 June)	6
Summer Semester "thru term" (9 June - 2 Aug)	6
Summer, Short Session I (9 June - 6 July)	7
Summer, Short Session II (8 July - 2 Aug)	6
Anytime	5

7. Would you prefer to develop a new course?

A. Yes	6
B. No	15

8. If you have a specific idea for a course, please provide a title and a one-sentence description of the content.

see originals

9. Would you be willing to mentor and/or advise students in the program?

A. Yes	15
B. No	11

10. What is the name of your department or unit?
(Optional)

11. What is your faculty/staff position type?
(Optional)
- Faculty
 - Professor
 - Assoc. Professor
 - Assist. Professor

12. Comments about the program.

see originals

APPENDIX F

Course Descriptions

Note: All courses are existing UGA course offerings

Courses	Credit	Prerequisites	Description
AAEC 3040 Agribusiness Marketing	3	AAEC 2580 or ECON 2106	Agribusiness marketing for farm products describing and analyzing agribusiness marketing functions to have a comprehensive understanding of the principles of agribusiness marketing.
AAEC 3060 Principles of Resource Economics	3	AAEC 2580 or ECON 2106	Basic theoretical concepts and analytical tools necessary to evaluate resource use, allocation, and policy. Emphasis is placed upon theoretical applications to natural, rural, and agricultural resources which impact both public sector and private sector economic activities.
AAEC 3100 Food and Fiber Marketing	3	AAEC 2580 or ECON 2106	Basic concepts of marketing food and fiber and related services and for making essential marketing decisions; approaches food and fiber product marketing as being individual and organization activities aimed at facilitating and expediting exchanges within a set of dynamic environmental factors.
AAEC 3300 Agribusiness Accounting	3	None	Accounting for agribusiness firms with emphasis on financial statement preparation and analysis of accounting information for managerial purposes. Special emphasis is given to problems of income measurement and asset valuation for agribusiness firms.
AAEC 3400 Introduction to Agricultural Policy	3	AAEC 2580 or ECON 2106	Domestic and international government policies affecting agriculture, agribusinesses, and rural economies. Policy alternatives aimed at solving economic and environmental problems of the food and agricultural sector are identified and evaluated.
AAEC 3610-3610L Applied Econometrics	4	AAEC 3580- 3580L	Basic applied econometric analysis, including simple regression analysis, hypothesis testing, model selection, and data collection techniques. Applications are an integral part of the course, with students using computers to solve problems common in agricultural and environmental sciences.

AAEC 3690-3690L Agribusiness Finance	4	(AAEC 2580 or ECON 2106) and (AAEC 2110 or ACCT 2101)	Financial concepts and analysis related to agribusiness firms, including analysis based on financial statements, business and financial risk, valuation, and capital budgeting.
AAEC 3980 Introduction to Agribusiness Management	3	AAEC 2580 or ECON 2106	Managerial concepts, procedures, and techniques in agribusiness management. Techniques of planning, organization, staffing, directing, and controlling functions of management.
AAEC 4650 Environmental Economics	3	AAEC 2580 or ECON 2106	Economic theory and methods applied to environmental problems and policies. Policies affecting individual and business decisions about environmental quality, policy formation, and incentive-based solutions; alternatives for reform evaluated for political and economic acceptability.
AAEC 4800/6800 - 4800L/6800L Water Resource Economics	3	AAEC 2580 or ECON 2106	The economic aspects of the use, supply, development, and management of water resources with special emphasis on river basin and project planning, benefit-cost analyses, water demands, and multiple use management of water resources.
AESC 4950 Special Problems in Agricultural and Environmental Sciences	1-3	Permission of department	Students will work with faculty to research special problems in agricultural and environmental sciences.
AESC 4960 Undergraduate Research	2-6	Junior or Senior standing	Directed research in agricultural and environmental sciences and policy; food and natural resources; engineering and technology, economic development, and international agriculture.
BCMB(BIOL) (CHEM) 3100 Intro. Biochemistry & Molecular Biology	4	(CHEM 2211- 2211L) or (CHEM 2311H- 2311L) or (CHEM 2411- 2411L)	The structure and function of biological molecules, enzymology, metabolism and bioenergetics, and recombinant DNA technology.
CRSS 2830 Introduction to Turfgrass Management	1	None	Turfgrasses and their management. Emphasis will be placed on how turfgrasses are used in society. Guest speakers from the turfgrass industry (golf course, sports fields, lawn care, etc.) who will discuss management systems and career opportunities.

CRSS 3060-3060L Soils and Hydrology	4	CHEM 1211- 1211L	Soil formation and morphology, physical and chemical properties, soil-water interactions, hydrologic processes and water balance in the landscape, and soil and water quality. Emphasis on landscape management of soil and water resources for both productivity and environmental quality.
CRSS 3270-3270L Turfgrass Management	3	None	Turfgrass management practices and systems. Species selection, establishment, irrigation, mowing, fertilization, cultivation, as well as weed, insect, and disease control. Discussions will include the benefits of turfgrass to society and various environmental issues impacting the turfgrass industry.
CRSS (ENTO) (PATH) 3500 Turfgrass Pest Management	3	CRSS 2830 or CRSS 3270- 3270L	Identification and control of turfgrass weeds, insects, and diseases. Emphasis will be placed on management strategies that include both chemical and non-chemical approaches to the prevention and control of common turfgrass pests.
CRSS 4040/6040 Plant Breeding	3	PGEN 3580- 3580L or permission of major	Fundamental principles and theories utilized in the science of plant breeding and cultivar development and the role breeding plays in crop improvement.
CRSS 4090 Advanced Turfgrass Science	3	CRSS 2830 or CRSS 3270- 3270L or permission of major.	The effects of the environment on turfgrass growth and quality management strategies for overcoming high and low temperature stress, as well as light and water deficits. Other topics include soil modification, golf green construction, developing fertilization programs, and discussions of various pesticide/environmental issues.
CRSS (ECOL) (ENGR)(FORS) (GEOG)(GEOL) 4170L-6170L Hydrology, Geology and Soil in Georgia	3	Permission of school	This field course focuses on the physical environment of Georgia by examining the diverse geology, soils, and surface and subsurface hydrologic processes within the state. We will travel to all of Georgia's physiographic areas, visiting mines, farms, forests, wetlands, rivers lakes, and estuaries to explore the influence of human activities on the physical environment.

CRSS 4340/6340 Weed Science	3	CHEM 1211 and CHEM 1211L	Fundamentals of weed biology; cultural and chemical weed control; properties and uses of herbicides and herbicide application equipment; and current systems for weed management in cropping programs.
ENTO 3740-3740L Insect Pest Management	4	BTNY 1220- 1220L or BIOL 1104-1104L or BIOL 1108- 1108L	An introduction to entomological science as a foundation for recognition and management of insect's pests in agriculture, landscape, and urban environments. Emphasis is on concepts of integrated pest management using a combination of cultural, biological, and chemical control strategies.
ENTO 3820-3820L Forest Protection Entomology	2	BIOL 1104- 1104L or 1108- 1108L	Major groups of insects and related arthropods. Identification, biology, and management techniques for major forest insects in North America.
ENTO 4000-4000L General Entomology	3	BIOL 1107- 1107L and 1108-1108L	Functional anatomy and physiology, behavior, ecology, insects as vectors of pathogens, chemical and biological control of pests. Laboratory sessions are devoted primarily to collecting and the identification of major families of insects.
ENTO (BCMB) (BTEC) 4200/6200 Biotechnology	3	BCMB 3100 and GENE 3200, MIBO 3500 or CIBO 3400	Applied aspects of biochemistry and molecular biology in various fields, with emphasis on the use of recombinant DNA methods and protein engineering.
ENTO 4250-4250L Pesticide Management and Utilization	3	CHEM 1212- 1212L	Practical management and utilization of pesticides in urban and agricultural environments. Subject areas include classification of insecticides, herbicides, and fungicides, etc., their general chemical and toxicological properties, deployment philosophy, hazards and environmental impact, formation and application, safety and disposal, and management of pesticides resistance.
ENTO 4360 Ornamental Pest Management	3	PATH 3530- 3530L and ENTO 4000/6000- 4000L/6000L	Introduction to pest management on ornamental crops grown in greenhouses and nurseries, with emphasis on insects and diseases. Emphasis on production practices and their influence on pest population development. Scouting, integrated pest management, chemical pesticides, and pest identification will be covered.
ENTO 4400/6400 Insect Behavior	3	ENTO 4000/6000-	Principles of behavior; communication, sexual behavior, anti-predator adaptations, insect-plant

		4000L/6000L	interactions, and sociality.
ENTO 4500-4500L Biological Control of Pest	3	(BIOL 1107- 1107L and 1108-1108L) or (BTNY 1210 and 1220)	The use of natural enemies to manage pest arthropods and weeds. Emphasis will be on principles, with examples of use. Laboratory will provide hands-on experience with natural enemies and their activity.
ENTO(CRSS) (PATH)4740/6740- 4740L/6740L Integrated Pest Management	3	ENTO 3740- 3740L or PATH 3530-3530L or CRSS 4340/6340	The utilization and integration of pest control tactics (cultural methods, biological control, pesticides, host resistance) for management of insects, pathogens, and weeds. The major methodologies for controlling pests are discussed individually and within the context of profitable production of selected commodities followed by discussion of multiple pest management using integrated control techniques.
FDST 4310/6310 Environmental Microbiology	3	MIBO 3000- 3000L or MIBO 3500	Types of microorganisms in the environment; effect of environmental conditions on microbial existence; public health aspects of environmental microbiology; applications of microorganisms to solve environmental problems.
HORT 2000 Horticultural Science	3	None	Horticultural science, the biology of horticulture, the technology of crop production and marketing, production systems, aesthetics, and crop types.
HORT 4090 Landscape Management	4	None	Landscape and maintenance. Non-traditional format: This course is also offered through University System of Georgia Independent Study (USGIS).
HORT 4440/6440- 4440L/6440L Environmental Physiology in Horticulture	3	BIOL 1103- 1103L and 1104-1104L or BIOL 1107- 1107L and 1108-1108L or PBIO 1210- 1210L and 1220-1220L	Effects of environmental factors on growth and physiology of horticultural plants and modification of the plant's environment to improve crop production.
MIBO 3500 Intro. to Microbiology	3	BCMB 3100 or BCMB 4020/6020	Microorganisms, with special emphasis on bacteria, their structure, function, diversity, and importance to man.

PATH 3530-3530L Intro. to Plant Pathology	3	(P BIO 1210-1210L, 1220-1220L) or (BIOL 1103-1103L, 1104-1104L) or (BIOL 1107-1107L and 1108-1108L)	Principles and concepts of plant pathology, including disease development, environmental interactions, microbial biology and life cycles, and disease control strategies. Broad concepts rather than diagnosis and control of specific diseases.
PGEN 3580 Principles of Genetics	3	(P BIO 1210-1210L and 1220-1220L) or (BIOL 1103-1103L and 1104-1104L) or (BIOL 1107-1107L and 1108-1108L)	Principles of heredity and Variation as related to all organisms. Emphasis on the application of genetic knowledge and on genetic experimentation.