Comprehensive Program Review Self-Study
Ed.S. Secondary Science
Columbus State University
September 2005

Executive Summary for the Ed.S. Secondary Science

Major Findings of the Program's Quality and Productivity

Program Quality: Very Strong
In February 2005, a continuing approval review of the College of Education was conducted by a Board of Examiners (BOE) consisting of representatives from the National Council for Accreditation of Teacher Education (NCATE) and the Georgia Professional Standards Commission (PSC). The 2000 NCATE Standards and the Georgia 2000 Standards were used to assess the unit and its programs. The BOE judged all standards to be met for the unit and for all initial and advanced programs. Overall, the Ed.S. Secondary Science program is strong and prepares highly qualified science teachers who are able to assume leadership roles in their schools, districts, and state.

Program Productivity: Satisfactory
Enrollment in the Ed.S. Secondary Science program has remained fairly stable over the past four years. Average enrollment over the four-year period from 2001-2005 was two students per year. Among the six Ed.S. programs housed in the Department of Teacher Education, the program ranks fifth in average student enrollment.. Because the program is small, courses are usually offered on a one- or two-year cycle, which helps with enrollment numbers. This contributes to the cost-effectiveness of the department. The program has a diverse group of majors (on average 88% female and 37% non-white) from a wide range of age groups. Graduates of the program are in high demand.

The number of Ed.S. Secondary Science degrees conferred by CSU is small (on average one per year) but has been fairly consistent over the past four years. As the only USG institution within a 90-mile radius of Columbus that offers a specialist degree in secondary science, CSU provides science teachers in its service region an opportunity that they might not have otherwise, to gain further expertise in science education and to develop their leadership skills.

List of Recommendations for Improving Program Quality
Though the program quality is very strong, we continue to look for ways to make improvements. Current initiatives include:

- aligning coursework with the new Georgia Performance Standards for Science in an effort to help prepare teachers to teach the new standards,
- connecting content in graduate science courses to the secondary curriculum so that teachers see the relevance of the science they are learning.

List of Recommendations for Improving Program Productivity
The Science Program Advisory Committee (PAC) will oversee the following efforts to improve the curriculum, courses, and resources offered to teachers.

- Align coursework with the new Georgia Performance Standards for Science (2005-2006) in an effort to help prepare teachers to teach the new standards. By responding to current initiatives and mandates, we hope to recruit more teachers into the Ed.S. program.

- Consider ways to connect the content of the graduate science courses to the secondary curriculum. By making the coursework more relevant to teachers, we hope to attract more teachers into the Ed.S. program.
- Recruit more students into the undergraduate science or science education programs.

Conclusion about the Program's Viability at CSU

The Ed.S. Secondary Science program at CSU is a viable one. As indicated by the evaluation of the NCATE/PSC Board of Examiners in February 2005, the quality of the program is very strong. All NCATE/PSC standards were judged to be met for all initial and advanced programs. In addition, program quality is enhanced by special opportunities available at CSU. Science education majors have access to resources and professional development opportunities offered through the Centers of Excellence such as Oxbow Meadows (for life science) and the Coca Cola Space Science Center (for the physical sciences.)

The viability of the program is also ensured by the collaborative relationship that exists and is ongoing between the College of Education and the Science Department. Representatives from these groups are working together to make improvements to the science education programs at CSU and to impact science education in our region. The Ed.S. program in secondary science is a valuable resource for teachers in our region who want to grow professionally, gain additional expertise, and pursue leadership opportunities in the field of science education. Students in the Ed.S. program take what they learn and apply it in their own classrooms to help their students learn science. They also share their expertise with other teachers in their schools, districts, and state.

Graduates of the Ed.S. Secondary Science program are also a valuable resource for our undergraduate program in secondary science. A substantial number of program graduates teach in systems served by CSU, especially Muscogee County. Our graduate programs in secondary science have helped to create a cadre of leaders within our Partner School Network. Graduates often serve CSU as pre-student teaching cooperating teachers and cooperating teachers for student teaching. They are an invaluable asset in assisting with the development of our undergraduates.

Though small, the number of Ed.S. Secondary Science degrees conferred by CSU has been fairly consistent over the past four years. As the only USG institution within a 90 mile radius of Columbus that offers a specialist's degree in secondary science, CSU provides science teachers in its service region an opportunity to gain expertise and pursue leadership opportunities in science education. These are opportunities that they might not have if CSU did not offer this degree program. With the critical shortage of highly-qualified science teachers, we need to provide every possible opportunity for teachers to grow professionally and enhance their knowledge and skills in teaching science.

Program Improvement Plan

In response to the findings of the Comprehensive Program Review, the faculty members and administrators of the Ed.S. in Secondary Science Education propose the strategies outlined below to improve the quality, productivity and viability of the program. These strategies will be facilitated by the Secondary Science Program Advisory Committee (PAC).

Departmental Plans and Priorities	***CPR Indicator***	***Projected Timeline***
1. Refine the College of Education Recruitment Plan to focus on specific methods for recruiting graduate students from diverse backgrounds	Productivity Viability	2006-2007
2. Explore various funding sources to provide scholarships for students seeking advanced degrees in Secondary Science	Productivity Viability	2006-Ongoing
3. Align appropriate graduate courses with the Georgia Performance Standards (GPS) to make the individual courses as well as the program highly attractive to prospective graduate students who will be implementing the GPS.	Quality Productivity Viability	2006-Ongoing
4. Consider ways to connect the content of the graduate science courses to the secondary science curriculum (Grades 6-12)	Quality Productivity Viability	2006-Ongoing
5. Combine the Ed.S. programs in secondary education under a common degree title that allows students to concentrate in a specific content area	Productivity Viability	2006-2008

The resources needed to accomplish these priorities should be minimal. Departmental resources will be allocated as necessary to accomplish these plans. Priority 2 will require the assistance of individuals in the Office of University Advancement to develop endowments which provide scholarships for graduate students. The Secondary Science Program Coordinator will be provided one course release time each academic year to provide leadership to these activities. The Program Coordinator will communicate additional resource requests as needed to the appropriate administrator within the College of Education at Columbus State University.

Summary Recommendation and Supporting Rationale

Recommendation: *Maintain the Program at the Current Level*
The program quality is very strong, but the number of degrees conferred each year is small. Until we are able to recruit more students into undergraduate programs in science or science education, opportunities for expansion of the Ed.S. program in secondary science will be limited. There are also factors beyond our control that have an impact on the Ed.S. program. Since teachers can get a specialist degree in any field and receive an increase in pay, some of the science teachers in our service region have chosen to pursue a specialist degree in an area other than secondary science.

As previously mentioned, CSU will continue to work to improve the current Ed.S. program in secondary science by responding to new initiatives (e.g., Georgia Performance Standards), improving the curriculum, providing better support and resources for students, and intensifying recruitment efforts. By enhancing the quality of the program, we hope to attract more potential students.

I. Ed. S Program Overview

The Education Specialist program in Secondary Science Education (grades 6-12) prepares highly qualified science teachers who display expertise in both content knowledge and instructional practice. At their best, they demonstrate leadership that broadens their influence in their school, their school system, and their professional community. Similarly, they display ideals necessary to promote high levels of learning for all grades 6-12 students. In science content courses, science pedagogy, curriculum and professional courses, candidates have multiple opportunities to demonstrate their expertise and leadership in teaching, scholarship, and professionalism. Creating opportunities for candidates to demonstrate excellence in these three areas is consistent with the College of Education (COE) Conceptual Framework and is reflected in the broad goals of the secondary science education program. These goals are briefly summarized as:

1. understanding and using science (scholarship);
2. planning effective instruction (teaching);
3. implementing effective instruction (teaching);
4. evaluating instruction, both the effect on individuals and on programs (teaching);
5. using research in making decisions about teaching and programs (scholarship);
6. becoming a professional (professionalism).

Specialist's degree candidates are highly qualified educators who demonstrated *proficiency* in each of these areas through initial certification programs and *expertise* as they progressed through the M.Ed. program in Secondary Science Education. Graduates of the program are prepared to be teacher leaders in the field of science education as they continue to apply their expert knowledge and skills to help all students learn.

Through its Ed.S. graduates in Science education, Columbus State University enhances the quality of secondary science teachers in school systems it serves. This is highly consistent with the CSU mission of serving the educational needs of a diverse region. By preparing highly qualified teachers in a critical needs area and developing teacher leaders, the program helps to improve the quality of education and the quality of life in the institution's service area.

II. **Summary Findings of the Program's Overall Quality**

In February 2005, a continuing approval review of the College of Education was conducted by a Board of Examiners (BOE) consisting of representatives from the National Council for Accreditation of Teacher Education (NCATE) and the Georgia Professional Standards Commission (PSC). The 2000 NCATE Standards and the Georgia 2000 Standards were used to assess the unit and its programs. The BOE judged all standards to be met for the unit and for all initial and advanced programs. Following is a summary of the findings taken from the BOE final report.

Standard 1: Candidate Knowledge, Skills, and Dispositions

Assessment data from Praxis I, Praxis II, GPA's, MAP evaluations, exit examinations, and national licensing exams indicate that teacher candidates know their subject matter and candidates for other school roles know their fields, both of which are aligned with professional, state, and institutional standards. MAP evaluations and the Disposition Evaluation Form give evidence that candidates and other school personnel know how to teach their subject matter and can deliver information in a clear and meaningful way so that all students learn.

Areas for Improvement: Candidates in Art Education, Biology, Chemistry, and French do not demonstrate content mastery.

Rationale: While overall more than 80 percent of the candidates in the unit have passed their respective content licensure exams, fewer than 80 percent of candidates in Art Education, Biology, Chemistry, and French passed their respective content licensure exams. Note: Chemistry and French had only one program completer each over the past three years.

Standard 2: Assessment System and Unit Evaluation

The unit maintains a comprehensive assessment system for the initial and advanced levels to ensure the systematic collection of data, providing opportunities for the unit to analyze, evaluate, and improve the quality of programs, unit operations, and candidate performance. The assessment systems reflect the conceptual framework and are aligned with INTASC and NBPTS standards as well as specialty professional associations. The unit utilizes information technologies to effectively collect and aggregate data for candidate, program, and unit improvement.

Standard 3: Field Experiences and Clinical Practice

All of the unit's programs which prepare candidates to become teachers or fill other roles as members of the education profession include field work/clinical practice as an integral part. Use of the MAP Evaluation Instrument and the Dispositions Evaluations which connects with the Conceptual Framework supports the work of the unit and provides scaffolding so that candidates acquire the knowledge, skills, and dispositions needed by those who are in professional education roles. Candidates are also surrounded by experienced, caring, competent professionals representing both the University and P-12 partners. Innovations such as the use of information technology for scheduling and tracking candidate progress in a very flexible and comprehensive database, the STEADY new teacher mentoring program, and the

refinement of the Partner School Network enhance the quality of the program and its graduates.

Standard 4: Diversity

The unit has clearly defined its candidate dispositions related to diversity, and these dispositions are assessed throughout required coursework in the initial and advanced programs. Three of the 32 unit faculty represent diversity. The diversity of candidates in unit programs roughly mirrors that of the university and service area as a whole. Because of the racial and ethnic diversity in the university's service area, initial and advanced candidates also work with a broadly diverse population of P-12 students.

Areas for Improvement: The College has not been successful in recruiting and retaining a diverse faculty.

Rationale: Even though efforts have been made to recruit additional minority faculty, currently there are three minority faculty in the unit. While this constitutes a slight improvement from 1998, a significant impact has not been made to ensure that candidates have the opportunity to work with diverse faculty.

Standard 5: Faculty Qualifications, Performance, and Development

Unit faculty have extensive academic backgrounds. Eighty-four percent (84%) of the full-time faculty, and seventeen percent (17%) of the part-time faculty hold terminal degrees while the remaining faculty either are working to complete doctoral studies or have master's degrees. Unit faculty are effective teachers who model best teaching practices in their areas of specialty. Most faculty have been engaged in scholarly activities and service activities to the local, state, regional, national, and international communities. All full-time tenured and non-tenured faculty are systematically and annually evaluated by their department chair, personnel committee, unit dean, and throughout the university input system. The faculty serve on committees and boards at the university and in the local community. They are also involved in local, state, and national professional associations. The unit has an expectation of professional growth/development of both full-time and part-time faculty, and faculty concur with the expectation by attending workshops and conferences, reading journals, and conducting research.

Areas for Improvement: Part-time faculty are not systematically evaluated.

Rationale: There is no systematic process for evaluating part-time faculty across the unit.

Standard 6: Unit Governance and Resources

The unit has the responsibility for authority for the delivery of the preparation of all professional educators. Systems and processes are in place to ensure that all constituencies are represented in the design, delivery and assessment of unit programs. Facilities, personnel and budget are adequate to meet the needs of candidates, faculty and programs. The unit does not require part-time faculty who teach or supervise student teachers to attend an orientation/training session on the conceptual framework or the use of the disposition or MAP rubrics.

Areas for Improvement: Not all part-time faculty are adequately trained on assessments used to evaluate candidates.

Rationale: The unit cannot ensure that part-time faculty have the requisite knowledge and skills to effectively assess candidates.

III. Summary Findings of the Program's Overall Productivity

Enrollment in the Ed.S. Secondary Science program has remained fairly stable over the past four years. Among the six Ed.S. programs housed in the Department of Teacher Education, the program ranks fifth in average student enrollment.. Because the program is small, courses are usually offered on a one- or two-year cycle, which helps with enrollment numbers. This contributes to the cost-effectiveness of the department. The program has a diverse group of majors (on average 88% female and 37% non-white) from a wide range of age groups. Graduates of the program are in high demand.

The number of Ed.S. Secondary Science degrees conferred by CSU is small but has been fairly consistent over the past four years. As the only USG institution within a 90-mile radius of Columbus that offers a specialist degree in secondary science, CSU provides science teachers in its service region an opportunity that they might not have otherwise, to gain further expertise in science education and to develop their leadership skills.

III A. Enrollment of Students in the Program

The enrollment pattern for the Ed. S. program in Secondary Science is shown in Table 3.1.

	2001-2002	2002-2003	2003-2004	2004-2005
Full-Time	0	0	0	0
Part-Time	2	3	1	2
Total	*2*	*3*	*1*	*2*

Table 3.1 Number of Declared Majors in Ed. S. Secondary Science – Fall Semester

The majority of students in the Ed.S. program are part-time students who teach during the day and take evening classes. Enrollment has remained fairly constant over the last 4 years.

Table 3.2 shows the total enrollment in all Ed.S. programs housed in the Department of Teacher Education at CSU. In average enrollment, it ranks fifth among the six Ed.S. programs listed in the table.

Program	2001-2002	2002-2003	2003-2004	2004-2005	Avg. Over Four Years
Early Childhood Education	13	5	1	1	5
Middle Grades Education	19	15	10	12	14
Secondary English	1	5	3	8	4.25
Secondary Mathematics	8	7	8	5	7
Secondary Science	***2***	***3***	***1***	***2***	***2***
Secondary Social Science	2	2	2	1	1.75
Total	*45*	*37*	*25*	*29*	*34*

Table 3.2 Number of Declared Majors in Ed.S. Programs – Fall Semester

The Science Program Advisory Committee (PAC) oversees the Ed.S. program in Secondary Science and works to improve the curriculum, courses, and resources offered to teachers.

Currently, we are aligning coursework with the new Georgia Performance Standards for Science in an effort to help prepare teachers to teach the new standards. By responding to current initiatives and mandates, we hope to recruit more teachers into the Ed.S. program.

III B. Annual Degree Productivity of the Program

As indicated in Table 3.3, the number of Ed.S. degrees conferred each year in Secondary Science is small. Among the six Ed.S. programs offered in the Department of Teacher Education, the Ed.S. Secondary Science program ranks fifth in average number of degrees conferred.

Program	2001-2002	2002-2003	2003-2004	2004-2005	Avg. Over Four Years
Early Childhood Education	4	5	1	0	2.5
Middle Grades Education	7	5	10	4	6.5
Secondary English	0	5	0	2	1.75
Secondary Mathematics	2	2	5	2	2.75
Secondary Science	***2***	***1***	***1***	***0***	***1***
Secondary Social Science	0	0	2	0	0.5

Table 3.3 Number of Degrees Conferred – Fiscal Year

There may be several factors contributing to the small number of degrees conferred each year.

1. Some students take several years to complete the program because of teaching schedules and other obligations.
2. The small number of students in the program.

The Science Department has hired three science educators within the last year and they are studying the curriculum in the graduate science courses. Ongoing efforts to connect the curriculum in these courses to the topics that are taught in high school will hopefully increase the number of Ed.S. degrees conferred each year as students begin to see the relevance of their coursework to their teaching. As the undergraduate program preparing secondary Science educators transitions from a B.S. Ed program housed in Teacher Education to a BA or BS in the content discipline with certification housed in the College of Science, faculty in the discipline are developing a greater sense of ownership for teacher preparation, including advanced programs. This can only help to improve and strengthen the advanced programs as well.

III C. Program Completion Efficiency & Graduation Rate

Table 3.4 shows the graduation rates for all Ed.S. programs housed in the Department of Teacher Education at CSU.

Program	2001-2002	2002-2003	2003-2004	2004-2005
Early Childhood Education	31%	100%	100%	0%
Middle Grades Education	37%	33%	100%	33%
Secondary English	0%	100%	0%	25%
Secondary Mathematics	25%	29%	63%	40%
Secondary Science	***100%***	***33%***	***100%***	***0%***
Secondary Social Science	0%	0%	100%	0%

Table 3.4 Graduation Rate

Graduation rates tend to fluctuate as students complete their programs of study at different rates. Students can normally complete the thirty-hour program in three to four semesters plus one or two summer sessions. The graduation rate for the Ed.S. in Secondary Science compares favorably with the other Ed.S programs at CSU.

Providing a quality program in Secondary Science is the primary concern of science and science education faculty. Columbus State University and the College of Education continue to make every effort to guide specialist's degree candidates toward demonstrating leadership in their schools and communities regarding science content, best practice pedagogy, and positive professional dispositions.

III D. Efficiency & Clarity of the Program's Course Requirements

The Ed.S. Program in Secondary Science Education requires a professional core (6 credits), a secondary education core (7 credits), and a concentration in either biology, chemistry, or earth science (17 credits). Course requirements are listed below.

Ed.S. Secondary Science Education

Course Requirements **Total Hours Required: 30**

Area 1: Professional Core	**Required Hours: 6**
EDUF 7115 Psychology of Teaching	3 Hours
EDUF 7116 Action Research	3 Hours
Area 2: Secondary Ed Core	**Required Hours: 7**
EDCI 7158 Leadership in the Curriculum Change Process	2 Hours
EDCI 7359 Specialist Project	2 Hours
EDSE 7135 Curriculum Studies in Secondary Science Ed.	3 Hours

Area 3: Concentration **Required Hours: 17**

*Select 12 semester hours from ONE of the following **fields of emphasis**:*

Biology:
BIOL/CHEM/ENVS (5000 level or above)
Chemistry:
CHEM/GEOL (5000 level or above)
Earth Science:
CHEM/GEOL/ENVS (5000 level or above)
Select 5 semester hours (7000 level or above) in related field
(Advisor Approval Required)

Total Hours Required: **30** (18 hours must be courses numbered 7000 or above)

These requirements are communicated online and through the CSU Catalog. At the beginning of each semester, a Graduate Orientation is held for all new graduate students. At this orientation, program requirements are clearly communicated, and the program coordinator works with each student to develop a tentative program of study. Subsequently, the program coordinator communicates with graduate students each semester by e-mail, phone, or face-to-face meetings to update degree progress sheets and advise on course selection.

III E. Frequency and Sequencing of Course Offerings Required for Program Completion

As shown in Table 3.5, courses required in the Ed.S. Secondary Science program are offered on a regular basis. Students beginning their program in summer semester can usually complete their program of study in four semesters, if they so choose. Students are advised to take EDUF 7116 early in their program of study. EDUF 7116 is a prerequisite or co-requisite for EDCI 7158, and EDCI 7158 is a prerequisite for EDCI 7359. Students typically take EDCI 7359 during one of the last two semesters of a student's program. Other courses may be taken in any order. As indicated in the table below, there are adequate science content offerings to allow students to complete the required concentration hours.

Number of Sections Per Semester													
	F 01	Sp 02	Su 02	F 02	Sp 03	Su 03	F 03	Sp 04	Su 04	F 04	Sp 05	Su 05	F 05
EDUF 7115		1	1		1		1			1	1		1
EDUF 7116	6	5	3	6	2	2	4	2	2		1	2	1
EDCI 7158	1			1		1		1	1			1	1
EDCI 7359	1	2		1	1	1	1	1	1	1	1		1
EDSE 7135		1			1			1	1				1
BIOL 5515G	2	1	1	1	2		2	1		2	1		2
BIOL 5525G	1	3	2	1	3	2	2	2	2	2	2	1	2
BIOL 5535G		1	1	2	2	3	1	2	1	2	1	2	3
CHEM 5000 and above	5115G 1						5115G 1			1			5115G 1
GEOL 5115G	1			1			1			1			1
GEOL 5135G		1			1			1			1		
GEOL 5215G										1	1		
GEOL 5555G		1		1	1				2	1		1	
GEOL 5000 and above	5255G 1	5165G 1 5175G 1 5275G 1		5255G 1	5165G 1 5175G 1		5255G 1 7565 1	5165G 1 5275G 1		5255G 1	5165G 1 5175G 1 5275G 1		5255G 1
ENVS 5000 and above	5255G 1 6105 1 6106 1 6207 1 7555 2	7115 1 7555 1	5225G 1 6206 1 7555 3	5255G 1 6105 1 6106 1 6207 1	5165G 1 6207 1 7115 1 7145 1 7555 2	6235 1 7555 1	5255G 1 6105 1 6106 1	5165G 1 6207 1 7115 1 7555 1	7555 1	5255G 1 6105 1 6106 1 7555	5165G 1 6207 1 7115 1	6235 1	5255G 1 6105 1 6207 1

Table 3.5 Frequency of Course Offerings

III F. Enrollment in the Program's Required Courses

Table 3.6 shows the average enrollment per section for required courses in the Ed.S. Secondary Science program. All Ed.S. students must take EDUF 7115 and EDUF 7116 so average enrollments in these courses are higher. EDCI 7158 and EDCI 7359 are required in the Ed.S. programs for all middle grades and secondary education majors. Enrollment in EDSE 7135 is the best indicator of enrollment trends in the secondary science program. This course has been offered 5 times since 2001 and has an average enrollment of 1.6. The course was twice cancelled due to lack of interest.

Average Enrollment Per Section													
	F 01	Sp 02	Su 02	F 02	Sp 03	Su 03	F 03	Sp 04	Su 04	F 04	Sp 05	Su 05	F 05
EDUF 7115		9	9		17		8			16	3		11
EDUF 7116	7.3	6	10	6.2	13.5	11	6.25	3.5	12.5		13	18.5	3
EDCI 7158	10			19		6		2	8			9	1
EDCI 7359	1	5		1	16	2	3	5	1	3	2		8
EDSE 7135		2			4			0	0				2
Biology Emphasis:													
BIOL 5515G	.5	1	4	2	.5		.5	1		2	2		1
BIOL 5525G	2	3.3	4.5			4	2.5	1.5	6.5	2	.5	2	2
BIOL 5535G		7	1.7	.5	1.5	6.7		5	1	.5			1
Chemistry Emphasis													
CHEM 5115G	1			0			3			0			2
Earth Science Emphasis													
GEOL 5115G	6			1			3			1			2
GEOL 5135G		1			3			6			0		

Table 3.6 Average Enrollment in the Program's Required Courses

By offering the required courses on a rotation cycle, enrollment is high enough those courses usually do not have to be cancelled. For EDCI 7359, students work independently with their academic advisors to complete their specialist projects. This course is offered whenever students need it.

III G. Diversity of the Program's Majors and Graduates

Table 3.7 shows the gender and ethnic origin of students in the Ed.S. Secondary Science program. Overall, the student enrollment by gender has been 88% female and 12% male. On average, 63% of the program's majors since Fall 2001 have been white, 25% have been black, and 12% have been Asian. There have been no international students in the program during this time period.

Gender	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**
Female	2(100%)	2(67%)	1(100%)	2(100%)
Male	0	1(33%)	0	0
Total	*2*	*3*	*1*	*2*
Ethnicity				
Hispanic	0	0	0	0
Black	1(50%)	1(33%)	0	0
Asian	0	0	0	1(50%)
White	1(50%)	2(67%)	1(100%)	1(50%)
Total	*2*	*3*	*1*	*2*

Table 3.7 Ethnic and gender diversity among Ed.S. Secondary Science majors

The gender and ethnic origin of program graduates since Fall 2001 is shown in Table 3.8. Overall, 50% of the program graduates have been male and 50% have been female. 75% of Ed.S graduates in Science Education have been White, 25% Black. This indicates a slightly lower graduation rate for minorities when compared to the enrollment figures. The reason for this is unknown at this time, but indicates that we need to track minority students that enroll in the program to determine if they are dropping out of the program or just taking several years to complete it.

Gender	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**
Female	1 (50%)	1 (100%)		
Male	1 (50%)		1 (100%)	
Total	*2*	*1*	*1*	*0*
Ethnicity				
Asian				
Black		1 (100%)		
Multi-Racial				
White	2 (100%)		1 (100%)	

Table 3.8 Ethnic and gender diversity among Ed.S. Secondary Science graduates

Students in the Ed.S. program in Secondary Science are from diverse age groups. The majority of students are between 40 and 50 years of age. Table 3.9 shows the age composition of all Ed.S students in the Secondary Science program since 2001.

Age	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**
21-25	0	0	0	0
26-30	1	1	0	0
31-40	1	0	0	0
41-50	0	2	1	2
51-60	0	0	0	0
Over 60	0	0	0	0
Total	*2*	*3*	*1*	*2*
AverageAge	*34.0*	*40.3*	*45.0*	*46.0*

Table 3.9: Age diversity among Ed.S. Secondary Science students

The larger number of students in the 40-50 age range is most likely due to the fact that a minimum of three years teaching experience and a master's degree is required for admission to the Ed.S.program.

III H. Cost-Effectiveness of Instructional Delivery in the Program's Home Department

As shown below in Tables 3.10 and 3.11, the budget for the Department of Teacher Education represented approximately 13% of the total instructional costs for Columbus State University (CSU) from 2001 to 2004. During this time period, over $1,000,000 of the department budget came from grant funds that, for the most part, supported the work of the Centers of Excellence (see note in Table 3.10). In 2004-2005, the department budget represented 8% of the total instructional costs at CSU. Considering that, in Fall 2004, 1340 (19%) of the 7224 students enrolled at CSU were majoring in a program offered through the Department of Teacher Education, instructional delivery in the department is very cost-effective.

For the graduate programs in secondary education, the cost per major has decreased by approximately 64% since 2001. In 2004-2005, the cost per credit was $284.00 compared to $162.15 for the institution. The higher cost per credit is due to the smaller number of students enrolled in graduate courses.

	2001-2002	2002-2003	2003-2004	2004-2005
Department Budget*	$3,116,951	$3,176,287	$3,143,501	$2,032,092
Cost Per Major (M.Ed. & Ed.S. Secondary Education majors) *(Pro-Rated Expenditures/Number of Declared Majors)*	$10,390	$8,359	$6,573	$4,064
Credit Hours Taught Fall and Spring (M.Ed. & Ed.S. Secondary Education majors)	989	1,387	1,335	1,358
Cost per Credit (M.Ed. & Ed.S. Secondary Education majors)	$567	$573	$542	$284
* Note: Centers of Excellence units (ETTC, CRMC, Child Care R&R and Oxbow Meadows removed from academic departments in FY 2005).				

Table 3.10 Instructional Costs for Department of Teacher Education and Graduate Secondary Education Programs

	2001-2002	2002-2003	2003-2004	2004-2005
Instructional Costs	$23,311,457.76	$23,963,598.65	$23,784,544.59	$25,240,030.43
Total Credit Hours	116,543	133,777	148,797	155,654
Cost per Credit	$200.02	$179.13	$159.85	$162.15

Table 3.11 Total Instructional Costs at CSU

By offering the required science education course in the Ed.S. Secondary Science program on a one- or two-year cycle, the number of students enrolled in these courses is high enough to contribute to the cost-effectiveness of the department. In addition, the program requires some of the same courses (e.g., Psychology of Teaching, Applied Educational Research, and Leadership

in the Curriculum Change Process) that are required in other Ed.S. programs. These courses have higher enrollments and thus help to contribute to the cost-effectiveness of the department.

The Science Program Advisory Committee (PAC) oversees the Ed.S. Program in Secondary Science and works to improve the curriculum, courses, and resources offered to teachers. Currently, we are aligning coursework with the new Georgia Performance Standards for science in an effort to help prepare teachers to teach with the new standards. By responding to current initiatives and mandates, we hope to recruit more teachers into the Ed.S. program to make it more cost-effective.

III I. Program's Responsiveness to State Needs and Employer Demand for Program Graduates

Most graduates of the Ed.S. Secondary Science program are already teaching in a middle or high school classroom. The expertise gained through the specialist's program contributes to these teachers' effectiveness in helping all students learn science. Graduates of the Ed.S. Secondary Science program are also a valuable resource for our undergraduate program in secondary science. A substantial number of program graduates teach in systems served by CSU, especially Muscogee County. Our graduate programs in secondary science have helped to create a cadre of leaders within our Partner School Network. Graduates often serve CSU as pre-student teaching cooperating teachers and cooperating teachers for student teaching. They are an invaluable asset in assisting with the development of our undergraduates.

The small number of science and science education majors at both the undergraduate and graduate levels limits this program's ability to be more productive and responsive to the needs of the state. The number of students who have the science background to pursue a graduate degree in science education is small. Some of our current efforts focus on trying to recruit more high school students into the secondary science program by:

- visiting area high schools to talk with students who are interested in science,
- bringing high school students in the Future Teachers Academy program on campus and providing them with information about degrees and career opportunities in science education.

In addition, we are working to attract more science teachers into the Ed.S. program by:

- aligning coursework with the new Georgia Performance Standards for Science in an effort to help prepare teachers to teach with the new standards,
- connecting the content of graduate science courses to the secondary curriculum.
- Sending information to in service teachers and staff development personnel in area school systems to inform them of available summer coursework and degree information.

III J. Position of the Program's Annual Degree Productivity among Comparable USG Programs

As indicated in Table 3.12, among the three USG state universities that offer a specialist's degree in secondary science, CSU ranks second in average number of degrees conferred. CSU is the only USG institution within a 90 mile radius of Columbus that offers a specialist's degree in secondary science.

Institution	FY 2001	FY 2002	FY 2003	FY 2004	Avg. of Four Years
State Universities					
University of West Georgia	4	3	5	5	4.25
Columbus State University	**1**	**2**	**1**	**1**	**1.25**
Augusta State University	0	0	0	0	0
Valdosta State University (Effective Date Unknown)	0	0	0	0	0
Regional and Research Universities					
University of Georgia	5	1	6	3	3.75
Georgia State University (program deactivated)	0	0	0	0	0
Georgia Southern University	1	1	1	1	1

Table 3.12 Ed.S. Secondary Science Degrees Conferred by Institution

III K. This Program's Contribution to Achieving CSU's Mission

The Ed.S. program in Secondary Science helps CSU to accomplish its mission of serving the educational needs of a diverse region. The University is dedicated to excellence in teaching in a student-centered environment and community engagement through university-community partnerships. The College of Education, through its Partner School Network, sponsored several workshops this year to help area science teachers incorporate the new Georgia Performance Standards into their classrooms. By preparing highly qualified teachers in a critical needs area, the program helps to improve the quality of education and the quality of life in the institution's service area.

IV. Conclusion about the Program's Viability at CSU

The Ed.S. Secondary Science program at CSU is a viable one. As indicated by the evaluation of the NCATE/PSC Board of Examiners in February 2005, the quality of the program is very strong. All NCATE/PSC standards were judged to be met for all initial and advanced programs. In addition, program quality is enhanced by special opportunities available at CSU. Science education majors have access to resources and professional development opportunities offered through the Centers of Excellence such as Oxbow Meadows (for life science) and the Coca Cola Space Science Center (for physical sciences.) The viability of the program is also ensured by the collaborative relationship that exists and is ongoing between the College of Education and the Science Department. Representatives from these groups are working together to make improvements to the science education programs at CSU and to impact science education in our region. The Ed.S. program in secondary science is a valuable resource for teachers in our region who want to grow professionally, gain additional expertise, and pursue leadership opportunities in the field of science education. Students in the Ed.S. program take what they learn and apply it in their own classrooms to help their students learn science. They also share their expertise with other teachers in their schools, districts, and state.

Graduates of the Ed.S. Secondary Science program are also a valuable resource for our undergraduate program in secondary science. A substantial number of program graduates teach in systems served by CSU, especially Muscogee County. Our graduate programs in secondary science have helped to create a cadre of leaders within our Partner School Network. Graduates often serve CSU as pre-student teaching cooperating teachers and cooperating teachers for student teaching. They are an invaluable asset in assisting with the development of our undergraduates.

Though small, the number of Ed.S. Secondary Science degrees conferred by CSU has been fairly consistent over the past four years. As the only USG institution within a 90 mile radius of Columbus that offers a specialist's degree in secondary science, CSU provides science teachers in its service region an opportunity to gain expertise and pursue leadership opportunities in science education. These are opportunities that they might not have if CSU did not offer this degree program. With the critical shortage of highly-qualified science teachers, we need to provide every possible opportunity for teachers to grow professionally and enhance their knowledge and skills in teaching science.

V. Program Improvement Plan

The Science Program Advisory Committee (PAC) will oversee the following efforts to improve the curriculum, courses, and resources offered to teachers.

- Align coursework with the new Georgia Performance Standards for Science (2005-2006). Work will be supported by a PRISM mini-grant.
- Explore ways to provide additional support for students in graduate science courses (ongoing).
- Consider ways to connect the content of the graduate science courses to the secondary curriculum (ongoing).
- Work to recruit high school students into science or science education (2005-2006 and beyond). Faculty members from the CSU Department of Teacher Education visit area high schools to talk with students who are interested in science or mathematics. Also, high school students in the Future Teachers Academy program are invited to CSU to learn more about degree programs and opportunities in science and mathematics. These efforts are supported by PRISM monies.

VI. Summary Recommendation

Recommendation: Maintain the Program at the Current Level

The program quality is very strong, but the number of degrees conferred each year is small. Because of decreasing interest in science as students progress through high school and college, few students take the higher-level science courses needed to prepare one for a career in science or science education. Until we are able to recruit more students into undergraduate programs in science or science education, opportunities for expansion of the Ed.S. program in secondary science will be limited. There are also factors beyond our control that have an impact on the Ed.S. program. Since teachers can get a specialist's degree in any field and receive an increase in

pay, some of the science teachers in our service region have chosen to pursue a specialist's degree in an area other than secondary science.

As previously mentioned, CSU will continue to work to improve the current Ed.S. program in secondary science by responding to new initiatives (e.g., Georgia Performance Standards), improving the curriculum, providing better support and resources for students, and intensifying recruitment efforts. By enhancing the quality of the program, we hope to attract more potential students.