

**Comprehensive Program Review Self-Study  
M.Ed. Secondary Science**

**Columbus State University  
September 2005**

## **Executive Summary for the M.Ed. 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 M.Ed. Secondary Science program is strong and prepares highly qualified science teachers who have the knowledge, skills, and dispositions to help all students learn.

#### **Program Productivity: Satisfactory**

Enrollment in the M.Ed. Secondary Science program has remained fairly stable since 2002 and ranks fifth in average enrollment among the ten M.Ed. programs housed in the Department of Teacher Education. The average enrollment for the four-year period from 2001-2005 was 18. 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 69% female and 29% minority) from a wide range of age groups. Graduates of the program are in high demand.

The number of M.Ed. Secondary Science degrees conferred by CSU is small (on average 5.25 per year) but has been fairly consistent over the past four years and is comparable to the number of degrees conferred by other USG state universities. As the only USG institution within a 90-mile radius of Columbus that offers a master's degree in secondary science, CSU provides science teachers in its service region an opportunity that they might not have otherwise, to gain expertise in science education.

#### **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 with 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).
- 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 M.Ed. program.

- Recruit more students into the undergraduate science or science education programs.

**Conclusion about the Program’s Viability at CSU**

The M.Ed. 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 and the Coca Cola Space Science Center.

The viability of the program is also ensured by the collaborative relationship that exists between the College of Education and the Science Department. Representatives from each of these groups work together to make improvements to the science education programs at CSU and to impact science education in our region. The M.Ed. program in secondary science is a valuable resource for teachers in our region who want to grow professionally and gain expertise in the field of science education.

Graduates of the M.Ed. 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 M.Ed. Secondary Science degrees conferred by CSU has been fairly consistent over the past four years and is comparable to the number of degrees conferred by other USG state universities. As the only USG institution within a 90 mile radius of Columbus that offers a master’s degree in secondary science, CSU provides science teachers in its service region an opportunity to gain expertise in science education. This is an opportunity 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 M.Ed. 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).

<i>Departmental Plans and Priorities</i>	<i>CPR Indicator</i>	<i>Projected Timeline</i>
1. Refine the College of Education Recruitment Plan to focus on specific methods for recruiting Secondary Science 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	2006-2007
4. Continue to connect the content of the graduate science courses to the Secondary Science curriculum	Quality Productivity Viability	2006-Ongoing

The Interim Dean and the Vice President for Academic Affairs have reviewed the plan and will commit financial and personnel resources to accomplish priorities 1, 3, and 4 for program improvement. Resources from external funding will be necessary to support priority 2. 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 M.Ed. program in secondary science will be limited. There are also factors beyond our control that have an impact on the M.Ed. program. Since teachers can get a master’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 master’s degree in an area other than secondary science.

As previously mentioned, CSU will continue to work to improve the current M.Ed. 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. Program Overview

The M.Ed. program in Secondary Science Education prepares highly qualified science teachers who possess the knowledge, skills, and dispositions necessary to promote high levels of learning for all grades 6-12 students. In science content courses, science education courses, professional courses, and field experiences, candidates have multiple opportunities to demonstrate excellence 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).

Candidates who have developed *proficiency* in each of these areas through initial certification programs should develop and demonstrate *expertise* as they progress through the M.Ed. program in Secondary Science Education. Graduates of the program are prepared to apply their expert knowledge of science and science teaching and learning in grades 6-12 classrooms, thus helping to meet the demand for highly qualified science teachers.

The M.Ed. program in Secondary Science helps CSU to accomplish its mission of serving the educational needs of a diverse region. By preparing highly qualified teachers in a critical needs area, the program helps 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 that connect 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 M.Ed. Secondary Science program has remained fairly stable since 2002 and ranks fifth in average enrollment among the ten M.Ed. programs housed in the Department of Teacher Education. 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 71% female and 29% minority) from a wide range of age groups. Graduates of the program are in high demand.

The number of M.Ed. Secondary Science degrees conferred by CSU is small but has been fairly consistent over the past four years and is comparable to the number of degrees conferred by other USG state universities. As the only USG institution within a 90-mile radius of Columbus that offers a master's degree in secondary science, CSU provides science teachers in its service region an opportunity that they might not have otherwise, to gain expertise in science education.

#### III A. Enrollment of Students in the Program

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

	2001-2002	2002-2003	2003-2004	2004-2005
Full-Time	6	4	6	5
Part-Time	7	18	14	12
<i>Total</i>	<i>13</i>	<i>22</i>	<i>20</i>	<i>17</i>

**Table 3.1 Numbers of Declared Majors in M.Ed. Secondary Science – Fall Semester**

The majority of students in the M.Ed. program are part-time students who teach during the day and take evening classes. Enrollment increased the most in Fall 2002.

This increase (59% over the previous year) may be due in part to the following:

- The introduction of the non-traditional fast track M. Ed., which allows students with baccalaureate degrees in science or related fields to pursue initial teacher certification and a M. Ed. simultaneously.
- Current domestic economic conditions
- Restructuring of graduate science education programs (e.g., offering a greater selection of courses during the summer and the availability of web enhanced courses, which allows graduate students more choice and availability.)

After the initial year for non-traditional enrollment, the numbers of students declined and stabilized.

Table 3.2 shows the total enrollment in all M.Ed. programs housed in the Department of Teacher Education at CSU. In average enrollment, it ranks fifth among the ten M.Ed. programs listed in the table. Most secondary education programs have seen an increase in enrollment since 2001.

Program	2001-2002	2002-2003	2003-2004	2004-2005	Avg. Over Four Years
Early Childhood Education	26	25	24	22	24.25
Health & Physical Education	10	13	11	11	11.25
Middle Grades Education	29	50	53	58	47.5
Secondary English	9	24	33	27	23.25
Secondary Mathematics	12	13	21	20	16.5
<b>Secondary Science</b>	<b>13</b>	<b>22</b>	<b>20</b>	<b>17</b>	<b>18</b>
Secondary Social Science	7	19	22	15	15.75
Special Education – Behavioral Disorders	15	15	18	16	16
Special Education – Learning Disabilities	22	33	28	31	28.5
Special Education – Mental Retardation	10	17	8	8	10.75
<i>Total</i>	<i>153</i>	<i>231</i>	<i>238</i>	<i>225</i>	<i>211.75</i>

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

The Science Program Advisory Committee (PAC) oversees the M.Ed. 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 M.Ed. program.

### **III B. Annual Degree Productivity of the Program**

As indicated in Table 3.3, the number of M.Ed. degrees conferred each year in Secondary Science is small but has increased every year since 2001-2002.

Program	2001-2002	2002-2003	2003-2004	2004-2005
Early Childhood Education	12	9	11	11
Health & Physical Education	1	3	6	6
Middle Grades Education	10	10	10	26
Secondary English	7	3	6	16
Secondary Mathematics	5	1	4	3
<b>Secondary Science</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>10</b>
Secondary Social Science	1	4	5	2
Special Education – Behavioral Disorders	7	5	8	3
Special Education – Learning Disabilities	10	8	13	7
Special Education – Mental Retardation	3	3	1	3

**Table 3.3 Number of Degrees Conferred – Fiscal Year**

There are 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. Some students in the M.Ed. program are working concurrently on coursework for teacher certification. They must complete their certification coursework prior to completing their M.Ed. degree.
3. Students sometimes fail to see the relevance of the required science content courses and the number of required science labs, and for many students this may be a deterrent to program completion.

The Science Department has hired three science educators within the last year and is beginning to study 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 M.Ed. degrees conferred each year as students begin to see the relevance of their coursework to their teaching.

### III C. Program Completion Efficiency & Graduation Rate

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

<b>Program</b>	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Early Childhood Education	46%	36%	46%	50%
Health & Physical Education	10%	23%	55%	55%
Middle Grades Education	34%	20%	19%	45%
Secondary English	78%	13%	18%	59%
Secondary Mathematics	42%	8%	19%	15%
<b>Secondary Science</b>	<b>8%</b>	<b>18%</b>	<b>30%</b>	<b>69%</b>
Secondary Social Science	14%	21%	23%	13%
Special Education – Behavioral Disorders	47%	33%	44%	19%
Special Education – Learning Disabilities	45%	24%	46%	23%
Special Education – Mental Retardation	30%	18%	13%	38%

**Table 3.4 Graduation Rate**

Graduation rates tend to fluctuate as students complete their programs of study at different rates. The graduation rates for the M.Ed. Secondary Science program are among the highest for the M.Ed. programs. This is due in part to the following factors:

1. Some students in the M.Ed. program are working concurrently on coursework for teacher certification. They must complete their certification coursework prior to completing their M.Ed. degree and this may contribute to an urgency to complete the program.
2. Students whose bachelor's degrees are in areas other than science, science education, or a closely related field must often take a significant number of prerequisite science courses, thus adding to the length of their program of study. This requires self-discipline and seriousness on the student's part that leads to success.

Providing a quality program in Secondary Science is the primary concern of science and science education faculty. We will continue to make every effort to provide meaningful and relevant coursework that prepares teachers with the knowledge, skills, and dispositions to help all students learn science. Ongoing efforts to offer relevancy of coursework and additional support and resources to teachers as they work on their M.Ed. degree should ensure that most students who enroll in the program are able to complete it.

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

The M.Ed. Program in Secondary Science Education requires a professional core (7 credits), a secondary education/concentration core (22 credits), and recommended electives (7 credits). The Program Advisory Committee for Science Education will begin fall term to evaluate the coursework for the M. Ed. Program in Science Education and make recommendations for change. At that time, a new, highly qualified Program Coordinator for Science Education will be on staff. Course requirements are listed below.

#### **M. Ed Secondary Science Education**

##### **Area 1 Professional Core**

**Req. Hours: 7**

EDUF 6115 Educational Psychology (3)

EDUF 6116 Research Methods (3)

EDUF 6795 Collaboration School/Student Academic Improvement (1)

##### **Area 2 Secondary Education Core**

**Req. Hours: 4**

EDCI 6158 Trends and Issues in Middle Grades and Secondary Education (2)

EDCI 6255 Teacher Inquiry and Investigation (2)

##### **Area 3 Concentration *Emphasis in Biology***

**Req. Hours: 18**

EDSE 6135 Teaching Science in the Sec School (3)

BIOL 5515G Selected Topics (Cell and Molecular Bio) (3)

BIOL 5525G Selected Topics (Organismic Bio) (3) (3) \*Taken twice

BIOL 5535G Selected Topics (Ecological and Evolutionary Bio) (3)

Select three semester hours from the following:

BIOL/CHEM/ENVS (6000 level) (3)

**OR**

##### **Area 3 Concentration *Emphasis in Chemistry***

**Req. Hours: 18**

EDSE 6135 Teaching Science in the Sec School (3)

Select 12 semester hours from the following:

CHEM 5000 level and above

Select three semester hours from the following:

BIOL/CHEM/ENVS (6000 level)

**OR**

##### **Area 3 Concentration *Emphasis in Earth Science***

**Req. Hours: 18**

EDSE 6135 Teaching Science in the Sec School (3)

GEOL 5115 Geochemistry (3)

GEOL 5135 Intro to Oceanography (3)

GEOL 5215 Geomorphology (4)

GEOL 5555 Selected Topics in Geology (3)

Select two semester hours from the following:  
BIOL/CHEM/ENVS (6000 level or above)

**Area 4 Electives**

**Req. Hours: 7**

Select two semester hours from the following:  
6000 level or above course with approval of Program Coordinator

Select five semester hours from the following:  
BIOL/CHEM/ENVS/GEOL/ (5000 level or above)

Total Hours Required: 36 (18 or more of these hours must be 6000 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 M.Ed. 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 6116 early in their program of study. EDCI 6158 is a prerequisite or co-requisite for EDCI 6255, which is usually taken during one of the last two semesters of a student's program. Other courses may be taken in any order. The new Science Education Program Coordinator and Secondary Science Program Advisory Committee will meet in the Fall to determine if changes are needed in the frequency or sequencing of courses being offered in the M. Ed. program.

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 6115	5	1	3	3	4	2	4	3	3	2	2	2	2
EDUF 6116	1	5	5	6	4	4	4	3	3	2	3	3	2
EDUF 6795										1	1	1	1
EDCI 6158	1		1	1		1	1		1	1		1	1
EDCI 6255		1	1		1	1	1	1	1	1	1	1	1
EDSE 6135		1			1	1		1			1	1	
EDMG 6135	1	1		1	1			1	1	1	1	1	
EDMG 6136							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	6235 1 7555 1	5255G 1 6105 1 6106 1	5165G 1 6207 1 7115 1 7555	7555 1	5255G 1 6105 1 6106 1 7555	5165G 1 6207 1 7115 1	6235 1	5255G 1 6105 1 6207 1

					1 7555 2			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 M.Ed. Secondary Science program. All M.Ed. students must take EDUF 6115, EDUF 6116, and EDUF 6795, so average enrollments in these courses are higher. EDCI 6158 and EDCI 6255 are required in the M.Ed. programs for all middle grades and secondary education majors. Enrollment in EDSE 6135 is the best indicator of enrollment trends in the secondary science program. This course has been offered 6 times since 2001 and has an average enrollment of 5.33. Efforts to recruit students to the M. Ed. program are ongoing. Science teachers and staff development personnel in the area schools were mailed information about summer offerings as well as graduate degree programs in science.

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 6115	8.4	26	13	13	13.5	15.5	11.5	10	15.3	22.5	18.5	14	19.5
EDUF 6116	25	8.8	12.2	7	13	16	13.5	19	18	25.5	14.7	17	21
EDUF 6795										35	12	16	65
EDCI 6158	13		16	25		15	26		29	28		26	24
EDCI 6255		11	7		22	12	17	21	18	9	26	12	16
EDSE 6135		6			9	5		6			0	6	
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

### III G. Diversity of the Program’s Majors and Graduates

Table 3.7 shows the gender and ethnic origin of students in the M.Ed. Secondary Science program. Overall, the student enrollment by gender has been 69% female and 31% male. These figures are comparable to the institution’s enrollment percentages by gender.

On average, 71% of the program’s majors since Fall 2001 have been white, 25% have been black, and 4% have belonged to other ethnic groups. There have been no international students in the program during this time period.

<b>Gender</b>	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Female	10(77%)	13 (59%)	13 (65%)	14 (82%)
Male	3 (23%)	9 (41%)	7 (35%)	3 (18%)
<i>Total</i>	<i>13 (100%)</i>	<i>22 (100%)</i>	<i>20 (100%)</i>	<i>17 (100%)</i>
<b>Ethnicity</b>				
Hispanic	0	1 (5%)	0	0
Black	4(31%)	6 (27%)	5 (25%)	3 (29%)
Multi-Racial	0	0	1 (5%)	1(5%)
White	9 (69%)	15 (68%)	14 (70%)	13 (76%)
<i>Total</i>	<i>13</i>	<i>22</i>	<i>20</i>	<i>17</i>

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

The gender and ethnic origin of program graduates since Fall 2001 is shown in Table 3.8. Overall, 29% of the program graduates have been male and 71% have been female. These figures are comparable with the overall enrollment percentages for the program by gender (31% male and 69% female). 76% of M. Ed graduates in Science Education have been White, 19% Black, and 5% Multi-Racial. 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. Recruiting minority students for the graduate program is ongoing. The College of Education as a unit has a minority candidate-recruiting plan in place. The Program Advisory Committee for Secondary Science Education will address this concern for M. Ed. candidates in the Fall.

<b>Gender</b>	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Female	0	4 (100%)	2 (33%)	8(80%)
Male	1(100%)	0	4(67%)	2(20%)
<i>Total</i>	<i>1</i>	<i>4</i>	<i>6</i>	<i>10</i>
<b>Ethnicity</b>				
Asian	0	0	0	0
Black	0	0	2(33%)	2(20%)
Multi-Racial	0	0	0	1(10%)
White	1(100%)	4(100%)	4 (67%)	7(70%)

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

Students in the M.Ed. program in Secondary Science are from diverse age groups. The majority of students are between 26 and 40 years of age. Table 3.9 shows the age composition of all M.Ed. students in the Secondary Science program since 2001.



<b>Age</b>	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
21-25	3	3	5	4
26-30	3	7	4	6
31-40	4	8	6	4
41-50	3	3	1	1
51-60	0	1	3	2
Over 60	0	0	1	0
<i>Total</i>	13	22	20	17
<i>AverageAge</i>	32.1	33.7	35.0	33.2

**Table 3.9: Age diversity among M.Ed. Secondary Science students**

The larger number of students in the 26-40 age range might be due to a couple of factors:

1. Students graduating from a bachelor's program usually teach for a while before entering a graduate program.
2. For some students in the M.Ed. program, teaching is a second career choice. They may be coming from another field to obtain teacher certification along with the M.Ed.

### **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.

	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
Department Budget*	\$3,116,951	\$3,176,287	\$3,143,501	\$2,032,092
Cost Per Major (M.Ed. & Ed.S. Secondary Education majors) <i>(Pro-Rated Expenditures/Number of Declared Majors)</i>	\$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**

	<b>2001-2002</b>	<b>2002-2003</b>	<b>2003-2004</b>	<b>2004-2005</b>
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 courses in the M.Ed. 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., Educational Psychology, Action Research, Trends and Issues, Teacher Inquiry, etc.) that are required in other M.Ed. 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 M.Ed. 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 M.Ed. 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 M.Ed. Secondary Science program are already teaching in a middle or high school classroom. The expertise gained through the master's program contributes to these teachers' effectiveness in helping all students learn science. Since 2001, graduates of the M.Ed. program who were not previously employed have had no trouble finding teaching jobs in science. We frequently get calls or letters from schools or districts within and outside our service region that are looking to hire science teachers.

Graduates of the M.Ed. 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 M.Ed. 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.

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

As indicated in Table 3.12, among the eight USG state universities that offer a master's degree in secondary science, CSU ranks fourth in average number of degrees conferred. CSU is the only USG institution within a 90-mile radius of Columbus that offers a master's degree in secondary science. To improve in productivity, the program must see an increase in the number of undergraduate and graduate candidates in science education. Our current efforts of recruiting high school students into science education include visiting area high schools to talk with students who are interested in science and inviting high school students in the Future Teachers Academy program to campus. Once on campus, we provide them with information about degrees and career opportunities in science education. We are working to attract more science teachers into the M.Ed. program by closely aligning coursework with the new Georgia Performance Standards in Science. In an effort to help prepare teachers to teach the new standards and by connecting the content of graduate science courses to the secondary curriculum, we hope to emphasize the relevancy of our M. Ed in Secondary Science and generate more interest in the graduate program.

<b>Institution</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>Avg. of Four Years</b>
<b>State Universities</b>					
University of West Georgia	9	14	7	2	8
North Georgia College & State University	5	6	3	7	5.25
<b>Columbus State University</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>3.75</b>
Georgia Southwestern State University	1	0	0	1	.5
Armstrong Atlantic State University (Program Deactivated)	4	6	5	4	4.75
Albany State University	1	1	4	0	1.5
Augusta State University	0	0	0	0	0
<b>Regional and Research Universities</b>					
University of Georgia	11	20	15	12	14.5
Georgia State University	23	36	38	39	34
Georgia Southern University	3	5	2	6	4
Valdosta State University	0	0	0	0	0

**Table 3.12 M.Ed. Secondary Science Degrees Conferred by Institution**

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

The M.Ed. program in Secondary Science helps CSU to accomplish its mission of serving the educational needs of a diverse region. 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 viability of the M.Ed. Secondary Science program at CSU is very satisfactory. 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 Centers such as Oxbow Meadows (for life science) and the Coca Cola Space Science Center (for physical science.) 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 M.Ed. program in secondary science is a valuable resource for teachers in our region who want to grow professionally and gain expertise in the field of science education. Students in the M.Ed. program take what they learn and apply it in their own classrooms to help their students learn science.

Graduates of the M.Ed. 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 M.Ed. Secondary Science degrees conferred by CSU has been fairly consistent over the past four years and is comparable to the number of degrees conferred by other USG state universities. As the only USG institution within a 90-mile radius of Columbus that offers a master's degree in secondary science, CSU provides science teachers in its service region an opportunity to gain expertise in science education. This is an opportunity 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 will 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 will be 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. Until we are able to recruit more students into undergraduate programs in science or science education, opportunities for expansion of the M.Ed. program in secondary science will be limited. There are also factors beyond our control that have an impact on the M.Ed. program. Since teachers can get a master'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 master's degree in an area other than secondary science.

As previously mentioned, CSU will continue to work to improve the current M.Ed. 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.