

1996

Department of Chemistry annual report, 1995-96

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DEPARTMENT OF CHEMISTRY

ANNUAL REPORT

1995-96

Annual Report
Department of Chemistry
1995-96

1. INTRODUCTION

A. Background

The Chemistry Department and its B. S. degree program were established in 1969 concurrently with the opening of the University of Central Florida (then, Florida Technological University). This B. S. program was certified as meeting the extensive requirements of the American Chemical Society in 1974. Recertification has been accomplished every five years since meeting the initial qualifications. In 1974, the M. S. program in Industrial Chemistry and the B. S. program in Forensic Science were added to the offerings of the Department. In 1995, the Forensic Science program was divided into two tracks -- the Analysis track and the DNA-Serology track. The tremendous movement of Forensic Science laboratories to the use of DNA in criminal cases has necessitated the development of this new curriculum. This program was presented to the University and accepted in 1995. Over twenty-five students have already selected this program.

B. Departmental Mission

1. Vision Statement

The Department of Chemistry has a multifaceted mission that includes providing the best education possible for our students, contributing significantly to tomorrow's knowledge through research, and being of service to our discipline, university, community, state and nation.

2. Mission Statement

The Department of Chemistry has a multifaceted mission that includes providing the best education possible for our students, contributing significantly to tomorrow's knowledge through research, and being of service to our discipline, university, community, state and nation. The Department seeks to expand its unique and nationally recognized B. S. Forensic Science program into graduate education. Chemistry is the central science and has a strong relationship with other departments and institutes. Our plans are to further extend those academic ties by developing an interdisciplinary Ph.D. program which can help focus on areas of academic strength.

Central to our efforts to provide the best possible education for our students is the maintenance of a contemporary and sound curriculum using guidelines provided by the American Chemical Society. Since chemistry is a laboratory science, special attention is to be given to the laboratory component of our curriculum. The use of technology where appropriate, will enable our faculty to continue to excel in the classroom and allow them to more efficiently and effectively teach and excite students about chemistry regardless of their major. With proper attention to our programs, the Department will serve as a resource for our pre-college teachers to update their knowledge and skills, and by being visible to pre-college students, we will encourage them to pursue their advanced studies in the sciences. Especially important is our efforts and success in reaching previously under-represented groups in the sciences.

Another facet of our mission is to contribute to tomorrow's knowledge through nationally and internationally recognized research programs. These research efforts will involve faculty, undergraduate and graduate students, and therefore will include a significant teaching component. Solving research problems gives students more experience in critical thinking and problem solving than any other component of their education; therefore, empowering the students with capabilities to be better contributors to their employers, state and nation.

An important part of our research mission is the formation of partnerships with private and public agencies on the local, state, national and international levels. These partnerships will allow the use of our problem-solving capabilities and will bring together our multifaced mission in teaching, research and service. Our response to the goals of the College and University will contribute to the elevation of the reputation of the University as a preeminent institution of higher education, thereby helping to maintain the University's growth and vitality.

3. Objectives for the Past Year

(1) Excellence in Teaching

Actions in 1995-96 on this Goal

- a. Worked with several faculty members in improving their teaching.
- b. Addressed teaching in all faculty evaluations and in individual meetings with each faculty member.

- c. Nominated Dr. Chris Clausen for the University's Excellence in Teaching award.

(2) Excellence in Research and Scholarship

Actions in 1995-96 on this Goal

- a. Established clear productivity goals with faculty.
- b. Continued to work on Institute for Drug Development and an Institute for Arson and Explosives.
- c. Also see item #3 and #5 in President's Five Goals.
- d. Results for 1996 in tangible items:
- 28 publications
 - 38 presentations
 - Over \$800,000 in funds from agencies and industry

(3) Increase Access to Chemistry Classes

Actions in 1995-96 on this Goal

Four new lecture sections and three laboratory sections were added in 1995-96. Budget, room availability and faculty availability prevented a greater expansion.

(4) Use of Technology for Improving Instruction

Actions in 1995-96 on this Goal

See item #1 - Contributions to the Dean's Initiative Program.

(5) Establish Industrial Affiliates Advisory Group

Actions in 1995-96 on this Goal

Contracts have been made with industry leaders by our committee. However, the meeting of these leaders will not occur until late fall or early winter. My Chair of this committee was simply too over committed in 1995-96 to put it together as we want to do. In addition, funds for bringing these leaders to UCF in 1996 were not available. I have appointed one of our new faculty members, Dr. Cherie Geiger, to assist Dr. Clausen with the arrangements. Dr. Clausen has met with Dr. Wanielista to talk about their excellent program.

**(6) Establish an Institute for Diagnostics and Drug Discovery
Actions in 1995-96 on this Goal**

The interdisciplinary effort to establish this Institute was successful in Stage 1 competitions. It was one of five proposals selected for stage 2 competition. Our committee has already met and have plans underway to accomplish the writing of the stage 2 proposal.

**(7) Implement New Curriculum Track in Forensic Science - Establish New Funding Base for Forensic Science
Actions in 1995-96 on this Goal**

The curriculum is in place and over forty students have selected that track. Potential faculty members are currently being interviewed to take the major responsibility for that track and to teach at least two of the new courses. The Department gets a tremendous number of inquiries about this program from all over the U.S.

**(8) Establish a Federal Reference Laboratory for Arson and Explosives in the Research Park
Actions in 1995-96 on this Goal**

A lot of activity occurred in support of this effort. Many proposals were written and rewritten and with advice from several people. \$3.1 million dollars was approved by congress as part of the Defense Bill. Since the approval, Dr. McGee and I, with Dr. Holsenbeck, visited the staff of Congressmen McCollum, Young and Mica. Revisions to the proposal were suggested by staff members and plans are currently being made to get the money released. A letter by the Florida congressional delegation has been submitted to Attorney General Reno of the Department of Justice for second year funding of \$5,000,000. Chancellor Reed has given his support to this project and has ranked it as one of the top federal initiatives in the State of Florida. Cooperative agreements with NFSTC is supporting this effort along with a consortium of USF and St. Petersburg Junior College. The project is a great undertaking and Dr. McGee has done a tremendous job in developing the idea and keeping the project moving forward.

(9) Complete Proposal for Establishing a Ph.D. Program in Applied Chemistry Actions in 1995-96 on this Goal

A draft proposal for the Ph.D. program in Applied Chemistry was completed. However, it has been placed on hold in favor of an interdisciplinary Ph.D. program with several departments involved, especially Chemistry from the College of Arts and Sciences and Molecular Biology and Microbiology of the College of Health and Public Affairs. Committees have been established after several meetings to begin the work of this new degree program. A tentative title of Applied Chemical and Biomolecular Sciences has been given to the Ph.D. program with three tracks, (1) Biomolecular Sciences, (2) Materials Sciences, and (3) Environmental Sciences.

C. Departmental Status

The Department began with four faculty members in 1968 and increased to eleven by 1976. Even though the productivity of the Department in majors, FTE, etc. has increased greatly, the number of faculty members has not changed much since 1971. Currently, the Department has fifteen faculty members, including one in full-time administration, one a geologist who teaches a general education course in geology, and one is responsible for the Forensic Science program. In addition, two faculty members that have tenure earning appointments in Chemistry have been added through the Center for Electro-Optics and Lasers and the Walt Disney Memorial Cancer Institute. Two new faculty members joined the department in 1995-96 as Assistant Professors. We expect to add two faculty members in 1996-97 that will be replacements for retiring and/or departing faculty. In addition, three scientists with the Walt Disney Memorial Cancer Institute have affiliated faculty appointments in Chemistry and will be listed at the end of this section.

The undergraduate degree program in Chemistry at UCF has established a reputation for producing outstanding students who are very capable of pursuing advanced degrees or going to work immediately for chemical or chemical related industries. Over 70% of our undergraduate

chemistry majors in the past five years have pursued graduate or professional studies. These excellent undergraduate products of our program are, in large part, due to the interest our faculty have in our students and the involvement of all Chemistry majors in faculty research efforts.

The Department has won nine Excellence in Teaching awards in the past fifteen years, far more than any other department. Four of these awards have been at the University level (one has been given each year for the past fifteen years) and five at the College level. In addition, four faculty have won the University wide research awards. All of our faculty involve students in their research, and this contributes significantly to the outstanding preparation of students. It is the opinion of our faculty, and has been since the inception of the Department, that there is no better place to teach chemistry than in the research laboratory. We see very little separation in teaching and research.

As mentioned in the previous paragraph, research is a very important part of the professional life of our faculty. Faculty are selected for their potential as teachers and researchers. They are expected to establish significant research programs that contribute to tomorrow's knowledge and provide a place for both undergraduate and graduate students to reach their potential. The success of our research efforts can be seen in the number of faculty receiving University research awards and in the extent of current funding which has averaged over \$750,000 in each of the last three years. It is our expectation that we will have even more research success as we add new faculty who are interested in making a research contribution to their respective fields.

Examination of our faculty's annual reports for the past five years will indicate the commitment to service activity at the College and University level, the State University System, their professional societies and their communities. Because of the professional manner in which our faculty serve their University, they are constantly requested to take an important role in many of the campus committees.

Plans for the future of the Department are extensive and some of these goals will be developed in the latter part of this report. One of the major problems we have been dealing with is the needed access to Chemistry courses, especially laboratory courses. This has required, and will continue to require, a close examination of resources of all types, i.e., expense, OCO and personnel. In addition, with the ever increasing student-to-faculty ratios, we must strive to find better ways to maintain our quality of instruction. The Department has always placed an emphasis on the individual student and on quality teaching. With the large increase in students, it is difficult to provide the individual attention needed. Some of our efforts to improve instruction, especially large lecture sections, will be discussed in another section of this report.

The Department has initiated plans for an interdisciplinary Ph.D. program with the Departments of Biological Sciences, Molecular and Microbiology, and appropriate faculty from the Departments of Physics, Computer Science, Environmental Engineering and Mechanical Engineering. The Department's initially independent Ph.D. plans are incorporated into this cooperative effort. Committees have been formed to draft this new proposal. Plans are for the degree program to begin in three to four years.

C. Faculty and Staff – Notable Changes

There were no changes in the support staff for the Department which includes five USPS full-time staff employees; one Laboratory Manager, one Laboratory Assistant, one Office Manager, one Senior Secretary and one Senior Engineering Technician/Designer. In addition, we employed one OPS part-time secretary, and six work study students (two in the Department office and four in the laboratory stockroom).

1. Identify New faculty by Name and Highest Degree

Dr. Harry Price has a Ph.D. in Biochemistry from the University of Illinois, Chicago. He comes to us after finishing a three-year post doctoral fellowship at John Hopkins where he conducted research on drug

resistance. Dr. Price joined us as an Assistant Professor and began his research and teaching in the fall term of 1995.

Dr. Otto Phanstiel received his Ph.D. from the University of Florida in Organic Chemistry. Prior to joining the chemistry faculty at UCF as Assistant Professor in August of 1995, Dr. Phanstiel was employed for General Electric as a Research Chemist for three years, and for the most recent three years, as a post doctoral fellow at the Center for Drug Discovery in the College of Pharmacy at the University of Florida. Dr. Phanstiel will primarily be teaching Organic Chemistry and performing research related to the synthesis of new drugs, new synthetic methods and the determination of their biological activity.

Two new faculty are expected to join the Department in the fall of 1996. Dr. Cherie Geiger will be a new faculty member in inorganic-physical chemistry with a research specialization in environmental chemistry research. She will join us in August of 1996. We are currently negotiating with a person to fill a new position in our Forensic Science program. This person will have background in biochemistry with a specialization in DNA related research. It is possible that this person will not be able to join us until January of 1997.

One faculty member, Dr. Kenneth Beck, resigned on December 31, 1995. A search is expected in the academic year 1996-97 to fill this vacant position.

2. Describe Current Teaching and Research Faculty

a. Number of Full-Time Faculty

There are currently (July 1996) fifteen faculty members (including the Chair).

One of our faculty members, Dr. Frank Juge, is in full-time administration as Vice Provost of Academic Affairs. A second faculty member, Dr. Frank Kujawa, teaches primarily the general education geology classes. A third faculty member, Dr. William McGee, is responsible for the Forensic Science program. Dr. Kathleen Richardson, Assistant Professor of Chemistry, is a scientist with CREOL and normally teaches

one course per term. She is very active in research and in directing graduate students. In addition, Dr. Barry Schweitzer is an Assistant Professor of Chemistry and a scientist with the Walt Disney Memorial Cancer Institute. He normally teaches one course per term and directs research of undergraduate and graduate students. Our other full-time faculty are Dr. Glenn Cunningham, Professor of Chemistry, Dr. Christian Clausen, Professor of Chemistry, Dr. Seth Elsheimer, Associate Professor of Chemistry, Dr. Michael Hampton, Associate Professor of Chemistry, Dr. Brooks Madsen, Professor of Chemistry, Dr. Guy Mattson, Professor of Chemistry, Dr. Howard Miles, Professor of Chemistry, Dr. Otto Phanstiel, Assistant Professor of Chemistry, Dr. Harry Price, Assistant Professor of Chemistry, and Dr. Louis Trefonas, Professor of Chemistry.

b. Number of Adjunct Faculty

The Chemistry Department hired one Adjunct Professor in the fall, Dr. Barry Fookes, who taught CHS 3505L, Forensic Microscopy.

In the spring, Dr. Kim Voss was appointed as Visiting Assistant Professor of Chemistry and taught CHM 1032, General Chemistry; CHM 2046, Chemistry Fundamentals; CHS 1440, Fundamentals of Chemistry for Engineers, and supervised the GTA's teaching CHM 2046L and CHM 1032L.

Dr. Cherie Geiger was employed in the spring term as an Adjunct Professor to teach CHM 2045, Chemistry Fundamentals I, and assist with CHM 4610, Inorganic Chemistry.

Also in the spring term, Dr. Tim Berry of the State Attorney's office, was hired as an Adjunct Professor to teach a forensic science course, CHS 3930, Law and Evidence.

c. Number of Graduate Teaching Assistants

The Department hired thirteen Graduate Teaching Assistants in the fall of 1995, fourteen in the spring of 1996, and six in the summer of 1996.

d. Number of Graduate Research Assistants, Post-Docs, and Other Research Faculty

Dr. Barry Schweitzer, had two post-doctoral fellows, Dr. Surat

Kumar from India and Dr. John West from the University of Florida.

Six Graduate Research Assistants were hired in the fall, five in the spring, and four in the summer of 1995. We also employed one research scholar from Spain in the summer of 1995.

e. Number of Courtesy Appointments

There were three courtesy appointments:

Dr. Samuel Gross, M.D., University of Rochester - "Distinguished Professor of Chemistry"

Dr. Gross was the Medical Director at the Walt Disney Memorial Cancer Institute at Florida Hospital.

Dr. Clifford Selsky, Ph.D., Microbiology Molecular Genetics, University of Miami - "Associate Professor of Chemistry"

Dr. Selsky is the Medical Director of the Hematology and Oncology for Children and Adolescents at the Walt Disney Memorial Cancer Institute at Florida Hospital.

Dr. John Francis, Ph.D. Hematology, Southampton University - "Professor of Chemistry"

Dr. Francis is the Director of Hemostasis and Thrombosis Research at the Walt Disney Memorial Cancer Institute at Florida Hospital.

All of the faculty receiving affiliated appointments are scientists hired in the last year by the Walt Disney Memorial Cancer Institute at Florida Hospital's research center. These are outstanding scientists who will contribute significantly to our research effort and to the direction of graduate students, as well as to the development of the Institute for Drug Development and Innovative Therapies.

2. ANALYSIS OF UNDERGRADUATE PROGRAMS

A. Student Enrollment

1. Undergraduate Majors and Minors

The national trend in the number of Chemistry majors has been on a slow decline. At UCF, there has been a slow but steady

increase, with an increase of 7.7% from 1988 through 1991 and a sharp rise of 24% in 1992-93.

In 1995-96, we purged our files of all inactive majors from our folders, leaving a total of 105 majors. I doubt there is really much of a change in numbers of Chemistry majors, rather I expect the numbers are relatively constant. I expect that many students who initially enrolled in Chemistry changed majors because of the difficulty of the major. The quality of the student seems to be improving again. With the purging of our files, it is difficult to see whether we increased or decreased in numbers. I expect that we changed very little in 1995-96. The growth in the number of Molecular and Microbiology majors probably impacted the number of Chemistry majors.

The number of Forensic Science majors reached a low point in 1990-91. The increase has been remarkable since that time with an increase from 12 in 1990-91 to 30 in 1991-92 and 38 in 1992-93. The data for 1993-94 shows a remarkable increase of 58%, giving a total of 60 majors. In 1994-95, an increase of 43% was seen, giving a total of 86 majors. Inactive students were removed from our files into a separate file. Students that had not taken any courses in two semesters were made inactive. When we did that, the number of forensic majors declined to 80. However, this is probably an increase of 10% to 15% of 1994-95 since inactive students had not been removed in 1994-95. Detailed planning is underway in an effort to handle this substantial increase (see Goals). A new track for this program was established in the spring term of 1995 to begin in the August of 1996. A new professor will be hired to develop the Forensic-DNA Serology track.

Chemistry and Forensic Majors

<u>DISCIPLINE</u>	<u>1991-92</u>	<u>1992-93</u>	<u>1993-94</u>	<u>1994-95</u>	<u>1995-96</u>
Chemistry	85	105	116	130	105*
Forensic Science	30	38	60	86	80*

*Inactive students removed from files.

2. Headcount Enrollments

The headcount in our classes has increased consistently during the past five years. The head count exactly parallels with the number of majors and my comments in that section would apply to this section as well.

Headcount by Major - Undergraduate

	Chemistry					Forensic Science			
	1993	1994	1995	1996		1993	1994	1995	1996
Freshmen	13	25	26	20		6	2	10	19
Sophomores	19	22	34	23		9	7	7	8
Juniors	26	17	21	25		11	23	16	13
Seniors	40	53	52	37		19	28	34	40
Total	98	117	133	105		45	60	67	80

*Includes 1 post-bac.

3. Distribution of Courses Offered

The distribution of the courses has not changed significantly in the last five years. Approximately 65% of the lecture courses offered in the fall and spring are upper division and 35% in the lower division. In laboratory offerings, the ratio is reversed with approximately 65% being lower division and 35% upper division. This switch is due to the large number of laboratory and discussion

sections associated with the large enrollment lecture sections of our General Chemistry sections. These ratios have not changed significantly in the last five years.

In the summer, large enrollment classes have been the choice because of limited funds. These are primarily our freshman level courses and the junior level Organic Chemistry course. Prior to 1993, summer laboratory offerings have been small because of the low student credit hour productivity. However, we have dramatically increased the number of laboratory offerings because our greatest available capacity is in the summer. This increase in the summer must continue since we are nearing capacity for the fall and spring terms for laboratory courses. The total number of sections is limited by the number of individual drawers available and available blocks of time. In the spring of 1995 and 1996, two sections of freshman chemistry laboratory were offered on Saturday morning and in 1996-97 it is anticipated that labs will be conducted on some days from 7:00 a.m. until 7:00 p.m.

**Undergraduate Lower Level Course Offerings
Number of Sections Offered**

	1993			1994			1995			1996		
	Lec	Lab	Disc	Lec	Lab	Disc	Lec	Lab	Disc	Lec	Lab	Disc
Summer	6	3	2	6	3	2	3	2	1	4	4	2
Fall	7	5	18	7	5	20	7	8	20	7	8	19
Spring	8	9	7	8	14	6	8	13	11	8	13	11

**Upper Level Undergraduate Course Offerings
Number of Sections Offered**

	1993		1994		1995		1996	
	Lec	Lab	Lec	Lab	Lec	Lab	Lec	Lab
Summer	2	2	2	1	3	3	2	3
Fall	9	8	9	8	10	6	10	11
Spring	11	9	12	9	11	9	17	11

B. Program Productivity Trends (Over Past 5 Years)

1. Student Credit Hour (SCH) Production

A remarkable increase of 33% was seen in student credit hour productivity in 1993-94, again reflecting the renewed interest in the chemical and medicinal sciences. Another 10% increase was seen in 1994-95. In our Annual Report of 1994-95, I indicated that I did not expect the trend to continue due to the fact that we were reaching our capacity with the faculty and space availability. The prediction certainly was true in that our increase was only 0.5% in 1995-96. State required reduction in hours (128 to 120) and leveling were probably responsible in part for the lack of continued growth in FTE production at the level of past years. We need more faculty and more room to increase SCH productivity. A second factor reducing the productivity is the decrease in degree requirements and leveling mandated by the State of Florida.

Undergraduate Student Credit Hours

Years	1991-92	1992-93	1993-94	1994-95	1995-96
SCH Total	9,722	10,272	13,629	14,936	15,010
Percentage Change	2%	5.7%	33%	9.6	0.5%

2. Number of Graduates

Nationally, most chemistry programs have been on a very slow decline in the number of graduates. Our number of chemistry majors has remained relatively constant over the past five years. In 1993-94, there was an 11% increase over 1992-93. In 1995-96, the numbers of Chemistry majors was the same as in 1994-95.

The Forensic Science program has been low in productivity in terms of numbers, but is a high value to Florida and the nation in that it provides very specialized forensic chemists for our law enforcement laboratories. We are attempting to meet that changing demand by adding our DNA serology track.

Number of Undergraduate Chemistry and Forensic Majors Graduating per Year

Discipline	1991-92	1992-93	1993-94	1994-95	1995-96	Total
Chemistry	12	11	13	15	15	66
Forensic Science	5	4	2	6	7	24

C. Program Quality

1. Curriculum Relevance and Innovativeness

The chemistry curriculum at UCF has been accredited continuously by the American Chemical Society since 1973. The curriculum guidelines for accreditation are relatively stringent and leave little room for flexibility in terms of type of courses offered. Recently an inorganic chemistry laboratory course was added due to a change in professional accreditation guidelines. A five year accreditation report was submitted to the American Chemical Society on July 15, 1993 and approved in the spring of 1995. An especially important part of our curriculum is undergraduate research. All students are expected to be involved in undergraduate research and are required to take at least one year. It has been our observation that there is no better place to teach chemistry than in the research laboratory. The opportunity for this type of involvement with state-of-the-art research

utilizing state-of-the-art equipment is not available for undergraduate students in most universities. Many students give presentations at regional and national meetings and have publications with faculty in national journals as a result of their undergraduate research. Our undergraduate research programs in Analytical Chemistry and Biochemistry have been highlighted in the quarterly Journal of Undergraduate Research. In a 1994 issue, our Chemistry Building graced the front cover of this national journal.

Contact with alumni, employers, internal and external reviewers all praise the quality of our chemistry majors, thus indicating the relevance and value of our curriculum. The undergraduate research experience gives them a great advantage over most students. The University must take a look at the value of this course and fund it properly.

The Forensic Science major takes most of the same courses as the Chemistry major through the junior year. The specialized Forensic Science major begins in the junior year and is concentrated in the senior year. Especially noteworthy is internship, which is served in a fully functional crime laboratory in the senior year. The internship is for one semester and our students have served internships in some of the best forensic laboratories in the United States. The contact and work with the top laboratory scientists in this field is invaluable.

2. Program Standards

All B.S. chemistry majors at UCF take the ACS accredited program. This means that a student will graduate with a minimum of 120 hours of credit and a minimum of 178 contact hours. Student course demand is especially high for our General Chemistry, Organic Chemistry, Analytical, and Biochemistry courses. Availability of large classrooms, laboratory space, GTA's, faculty and a sufficient expense budget have limited our capability to meet this enrollment pressure. Especially critical is the lack of sufficient laboratory space and expense budget to meet the demands for our General and Organic Chemistry courses.

The teaching evaluations of our courses are taken very seriously. In addition, the performance of the chemistry majors and other science majors in graduate school or in places of employment is closely monitored. Feedback from these sources is used to improve classroom effectiveness. Results of this attention to the teaching function can be seen in that four of our faculty have won the University teaching awards (one given per year) and seven have won the College award. This far exceeds any other department at UCF.

We are in the process of an extensive examination of our freshman courses, CHM 1030, 1032, 1440, 2045 and 2046. A committee consisting of Dr. Hampton, our freshman Chemistry coordinator, with committee members, Dr. Cherie Geiger, Dr. Chris Clausen, Dr. Kathleen Richardson and Dr. Louis Trefonas has been appointed to carry out this examination and make recommendations to the Chair. It is necessary that we utilize technology in the classroom since overheads and chalk are unsatisfactory for classes over 100. In 1995-96, Dr. Michael Hampton and Dr. Kathleen Richardson received a grant from the Dean's Initiative Award program to improve the usage of technology in the classroom. A laptop computer coupled with a video projection system will enable better visualization and better presentation in all classrooms. Dr. Richardson and Dr. Hampton will serve as a resource for all of our faculty in the use of this new technology. Even for small classes, modern technology properly utilized can greatly improve the teaching environment. We want students to come out of the freshman course excited about chemistry and not to think of it as a hurdle to get over. Several other laboratory courses are being updated with the addition of new experiments. In some courses this has required the purchase of new equipment to make the upgrade possible. In the last ten years the Department has received over \$400,000 worth of instructional equipment from very competitive NSF grants and gifts from industry. These funds, along with state funds, have assisted in this redesign. The central theme in every case is to develop hands-on discovery type experiments rather than a cookbook "fill in the blank" approach.

3. Student Quality

There are no single capstone courses in chemistry to measure student quality. The performance of our students in graduate school, professional schools, and in places of employment is monitored closely. In all cases, we find that our students excel in comparison to graduates from other institutions. Another measure of the quality of our product is the fact that 70-75% of our students are in graduate school with most pursuing a Ph.D. degree. Most of these students in graduate school were awarded excellent, fully-funded fellowships to pursue their work. We have a difficult time scheduling all of those universities that desire to give a seminar to recruit our students. Our students that just have an average GPA are still recruited extensively because other schools know the reputation of our undergraduates and master's program in chemistry.

In Forensic Science, most of the students go directly to work in crime laboratories after receiving their B.S. degrees. Dr. McGee, the Director of our Forensic Science program, keeps in close contact with the employers of these students in order to properly gauge the effectiveness of the forensic program at UCF. At this point in time, the reviews have been very positive. Dr. McGee has added a second track to the Forensic Science program to include the education and training related to DNA testing. The focus of many, many crime laboratories has been DNA-related techniques.

In 1996-97, we will have an extensive effort underway to develop appropriate measures of the effectiveness of our undergraduate programs. The Department Chair has requested input from faculty on what they perceive as the outcome of our undergraduate programs in Chemistry and Forensic Science. In addition, the Department Chair has developed several questions for the Undergraduate Curriculum Committee to consider in their evaluation of our undergraduate program. This is a part of our extensive accountability study of our programs.

3. ANALYSIS OF GRADUATE PROGRAMS

A. Student Enrollment

1. Headcount for Students Enrolled in the M.S. Industrial Chemistry

1991-92	1992-93	1993-94	1994-95	1995-96
30	24	30	30	29

The enrollment in our Master of Science program in Industrial Chemistry has remained relatively constant for the past five years. The primary reason for this is due to a limitation of resources. In order to increase numbers significantly, the department would need a greater number of GTA and GRA stipends, increased expense budget, and more faculty.

2. Distribution of Courses Offered

The distribution of courses offered is shown in the following table:

Master's Level Course Offerings

	1992		1993		1994		1995		1996	
	Lec	Lab	Lec	Lab	Lec	Lab	Lec	Lab	Lec	Lab
Summer	0	0	1	0	1	0	1	0	1	0
Fall	4	0	3	0	4	0	4	1	5	0
Spring	4	0	3	1	5	1	4	0	5	0

There was no significant change in the distribution of courses offered until 1995-96. Starting in 1990, additional course options were added and some courses were consolidated, based upon an analysis of student need. In addition, to improve our efficiency, some of the optional courses were placed in an "every other year" rotation. In 1995-96, there was a change in course numbering, resulting in one undergraduate course being changed to graduate and one new course was offered by Dr. Schweitzer.

B. Program Productivity Trends (Over past 5 Years)

1. Student Credit Hour Production

Student credit hour productivity increased steadily to 1992 and has dropped slightly in 1992-93 due to a decrease in the number of GTA's. There was an increase of 31% in 1993-94 primarily due to an increase in the number of GTA's and GRA's. Students do not enroll in the chemistry graduate program full-time unless graduate teaching assistantships and graduate research assistantships are offered.

M. S. Student Credit Hour Productivity

1991-92	1992-93	1993-94	1994-95	1995-96
250.00	208.00	273.00	321.00	306.00

During the next year, the credit hour productivity is expected to remain at the 1994-95 level. Increases beyond 1995-96 numbers will depend on level of support.

2. Number of Graduates

The following table depicts the number of graduates in our M. S. program in Industrial Chemistry:

Number of M. S. Graduates

1991-92	1992-93	1993-94	1994-95	1995-96
4	5	3	4	7

The drop seen in 1993-94 is due to the decreased number of GTA's in 1990-91. The number of graduates was expected to rise to, or above, the level seen in 1992-93 since the number of GTA's and GRA's has been increased. The number of graduate students is expected to remain within the five - seven range for the next five years. This is seen with our data for 1995-96 which shows seven graduates. The major limitation to increasing the number is to further increases in GTA and GRA support as mentioned in the previous section.

C. Program Quality

1. Demand for Program

The demand for our program has always far exceeded the number of available slots, especially from international students. The number of quality applicants to the program remains high. However, this is not expected to continue unless we stay competitive in GTA stipends. A committee chaired by our Graduate Coordinator was formed. We have kept the number of international students limited due to the fact that we require a demonstrated capability to converse in the English language for GTA's. The second major limitation in increasing enrollment is the number and level of graduate teaching and research stipends. Good students are sought after by graduate schools and GTA and GRA stipends offered by many schools far exceed our stipend offer. Our current level of \$10,000 was established in 1992. The current national range is from \$12,000 - \$15,000.

2. Student Support

Graduate Students

During the past year, thirteen GTA's were supported from E&G funds in the fall and fourteen in the spring, and nine in the summer of '96. Six GRA's were supported by C&G funds in the fall, five in the spring, and four in the summer of 1995. The current level of support for GTA's and GRA's is \$5,200 for fall and spring and \$3,300 for the summer.

Undergraduate Students

Four undergraduate students were paid from E&G funds for the year. Ten undergraduate students were paid from C&G funds in the fall, nine in the spring and twelve in the summer.

Fellowships and Other

One Chemistry undergraduate major was the recipient of the Frank E. Juge, Sr. Memorial Freshman Scholarship, an annual memorial fund established by Dr. Frank and Beth Juge in memory of Dr. Juge's father.

Summary of GTA's and GRA's

Category 1995 - 1996	Student Level	Average Number 1995-1996	Average Paid Per Student/Per Term
E&G Funds	Graduate (GTA's)	13	\$5,200
	Undergraduates	4	\$4,800 (Year) *
C&G Funds	Graduate (GRA's)	6	\$5,200/Term
	Undergraduates	6	\$2,240/Term **
Fellowships & Other	Post Doctoral	1	\$40,000
Fellowships & Other	Undergraduate	1	\$1,000

* Based on \$5.00 an hour @ 15-20 hours per week.

** Based on \$7.00 an hour @ 20 hours per week.

3. Program Standards

The Graduate Record Examination (GRE) is required of all graduate students. Minimal requirements for admission include a grade point average (GPA) of 3.0 for the last 60 semester hours of undergraduate study or a score of at least 1000 on the combined quantitative-verbal sections of the General Aptitude test of the GRE. In addition, the Departmental evaluation relies on letters of recommendation. Proficiency examinations are given to all incoming graduate students. The results of these exams are used in planning the student's program of study. Deficiencies may require remedial course work.

The minimum semester hours required for graduation is 30 and a minimum GPA of 3.0. All students have a committee of at least three faculty members for program planning who are also responsible for the final oral exam and thesis review. All students are required to submit a thesis on their research, present an oral defense, and answer any questions

presented by the student's program committee and any faculty member. The faculty committee members will cast a "pass" or "fail" vote and will design the remedial work required if failure does occur.

All students are expected, with the help and co-authorships of their major professor, to present their work for publication in refereed publications. In addition, they are encouraged to present their work at national or regional professional meetings. Appendix IV shows many publications and presentations co-authored with students.

4. Student Quality

Over the past five years, students have had an entry GPA average of approximately 3.14 and a GRE of 1067. Current students follow approximately the same trend. There are no professional exams other than the GRE for entering students, and the measures of quality are those discussed in the last section for graduation requirements. Since we are not a large program, we are able to keep in contact with most of our graduates and their employers. Uniformly, the comments about our graduates concerning their preparation for further study or work are extremely positive. Similar positive comments are made by the employers. We take these comments very seriously, and where needed, make the necessary program improvements. We are beginning an Industrial Affiliates Advisory Board to give advice about our B.S. and M.S. programs. Many of the first group on our Advisory Board will be from those employers already employing our graduates. Our first preliminary meeting included representatives from Shell; Schering/Plough; Rhone-Poulence Rorer; Post, Buckley, Schuh & Jernigan; Bionomics; Bionetics; and the Florida Solar Energy Center.

4. RESEARCH AND SCHOLARLY ACTIVITIES

A. Scholarly Productivity

1. Trends in Scholarly Productivity (Over Past Four Years).

There were 24 publications in regional, national or international in 1991-1992, 31 in 1992-1993, 31 in 1993-94, 35 in 1994-95 and 28 in 1995-96.

For each of those years, the percentage of faculty involved in publication was 65% to 70%. The number of presentations for regional, national or international meetings was 31 for 1991-1992, 27 for 1992-1993, 33 for 1993-94, 42 in 1994-95 and 38 for 1995-96. The decline in the number of presentations and publications in 1995-96 as compared to 1994-95 was due in part to the loss of a very productive senior professor and the resignation of a second research productive faculty member. Two new Assistant Professors were added in the fall and are now establishing their research program that will result in an increased number of publications and presentations. Lack of sufficient departmental support for travel has had a detrimental effect in the number of presentations. Each year 60% to 65% of the faculty were involved in presentations. In addition to the presentations listed above, faculty members presented 15 to 20 seminars at universities and companies. These are summarized in the Appendix.

Number of Faculty Publications and Presentations

1992-93		1993-94		1994-95		1995-96	
Pubs	Pres	Pubs	Pres	Pubs	Pres	Pubs	Pres
31	27	31	33	34	42	28	38

2. External Funding

The level of external funding has been expanding significantly since 1990-91, at which time it was at the \$300,000 level, approximately \$700,000 in external funding in 1991-92, \$800,000 in 1992-93, and \$1,124,861 in 1993-94. The increase for 1993-94 over 1992-93 was 39% and marks the first time we have exceeded one million dollars in external funding. In 1994-95, funding exceeded \$800,000. In 1995-96, the funding level was \$716,000. This decrease was primarily due to the loss of a very highly productive faculty member, Dr. John Gupton, who was responsible for \$200,000 plus in external funds per year. We expect that slack to be taken up as our new faculty, Drs. Geiger, Phanstiel and Price develop their research programs.

We are also adding a new faculty member in Forensic Science in January of 1997. In 1995-96, Dr. Schweitzer received \$750,000 for his work from Florida Hospital. This amount is obviously not included in the 1995-96 total. Several grants remain pending and some of these appear to be promising. In each of the last three years, 70% to 80% of the faculty have received external funding. In 1993-94, 78% received funding.

One of our faculty members who is not research funded is teaching GEP Geology courses and a second one returned to the faculty after being in administration for the past fifteen years. A list of external grants received is listed in the following table.

ATTACHMENT 7
 SUMMARY OF CHEMISTRY DEPARTMENT CONTRACT AND GRANT ACTIVITY
 July 1995 - June 1996

<u>Principal Investigator</u>	<u>Department</u>	<u>Amount of Award</u>	<u>Funding Agency</u>	<u>Award Date</u>	<u>Project Title</u>
Dr. Clausen	Chemistry	\$49,957	NASA-Kennedy Space Center	6-1995	The Development of Methodologies and Solvent Systems to Replace CFC-113 in the Cleaning and Validation of Spacecraft Hardware
Dr. Clausen	Chemistry	\$62,656	Battelle Corporation	10-1995	Investigation of Carbon Filaments from Hydrocarbon Feedstocks
Dr. Clausen	Chemistry	\$87,299	NASA-Kennedy Space Center	7-1995	Enhancement of In-Situ Zero-Valent Metal Treatment of Contaminated Groundwater
Dr. Clausen	Chemistry	\$11,923	U. S. Army	12-1995	The Development of an Acoustical Particle Counter
Dr. Cunningham	Chemistry	\$10,000	American Cancer Society - Florida Division	6-1996	Summer student fellowships to conduct cancer research in laboratory
Dr. Hampton, Co-P.I./ Dr. Richardson	Chemistry	\$4,566	Dean's Initiate Award - College of Arts and Sciences	2-1996	Infusion of Technology into the Chemistry Classroom
Dr. Hampton	Chemistry	\$15,599	United Technologies/Pratt & Whitney	11-1995	The Development of Test Procedures for Determining the Concentration of Oxidative Stability Additives in JP-8 Jet Fuel
Dr. Hampton	Chemistry	\$5,000	New York University	6-1995	Funding to attend Workshop in Multimedia for Higher Education
Dr. Madsen	Chemistry	\$17,948	NASA - Kennedy Space Center	1-1996	Evaluation of Acid Rain in Central Florida

Dr. Madsen	Chemistry	\$18,895	NASA/Kennedy Space Center	1-1997	Evaluation of Acid Rain in Central Florida
Dr. Mattson	Chemistry	\$48,160	Constar International	3-1996	PET Viscosity
Dr. Mattson	Chemistry	\$12,951	Xenon Research	3-1996	The Preparation and Evaluation of Poly Compositions
Dr. McGee	Chemistry	\$5,200	Dean's Initiative Award - College of Arts and Sciences	2-1996	Evaluation of Software for Importing Instrument-Generated Data into Computer Based Laboratory Experiments
Dr. Miles (Co-P.I. w/Drs. Hawkins, Phanstiel & Price)	Chemistry	\$6,869	Dean's Initiative Award - College of Arts and Sciences	2-1996	Interdisciplinary Environmental Science Course Development
Dr. Miles (Co-P.I. w/Drs. Cunningham, Francis and Schweitzer)	Chemistry	\$25,000	UCF - Chemistry Department, International Studies, DSR and Walt Disney Memorial Cancer Institute	8-1995	Drug Discovery from Medicinal Plants of the Mekong River Delta of Vietnam
Dr. Miles (Co-P.I. with Dr. Brennan)	Chemistry	\$16,000	USAID-FSU	12-1995	USAID-FSU - Indonesian Higher Education Development Project
Dr. Miles	Chemistry	\$16,000	UCF - Chemistry Department and College of Arts and Sciences	7-1995	Travel Grant to Visit Ho Chi Minh City University of Technology and the University of Ho Chi Minh City
Dr. Phanstiel (Co-P.I. with Drs. Hawkins, Miles and Price)	Chemistry	\$6,860	Dean's Initiative Award - College of Arts and Sciences	2-1996	Interdisciplinary Environmental Science Course Development
Dr. Phanstiel	Chemistry	\$7,500	DSR - UCF	6-1997	Synthesis and Biological Evaluation of Polyamine-DNA Intercalator Conjugates

Dr. Phanstiel	Chemistry	\$35,000	Research Corporation	7-1996	Synthesis and Biological Evaluation of Polyamine-DNA Intercalator Conjugates
Dr. Price (Co-P.I. w/Drs. Hawkins, Miles and Phanstiel)	Chemistry	\$6,860	Dean's Initiative Award - College of Arts and Sciences	2-1996	Interdisciplinary Environmental Science Course Development
Dr. Price	Chemistry	\$7,480	DSR - UCF	1-1996	Screening Plant Extracts for Inhibitors of DNA Precursor Biosynthesis
Dr. Richardson (Co-P.I. with Dr. Hampton)	Chemistry	\$4,566	Dean's Initiative Award - College of Arts and Sciences	2-1996	Infusion of Technology into the Chemistry Classroom
Dr. Richardson	Chemistry	\$29,800	Texas Instruments, Inc.	12-1995	Glass Characterization
Dr. Richardson	Chemistry	\$399,000	National Sciences & Engineering Research Council of Canada	1-1996	Guided Wave Optical Devices based on Novel Glasses
Total		\$892,803.00			

3. List of Scholarly Activities (Current Year)

- a. Publications**
- b. Presentations**
- c. Creative Activities (Performances, Exhibits, Commission, Productions, Etc.)**
- d. Student publications, presentations and creative activities not listed in faculty lists.**

See appendices for all of the above.

5. INTERNATIONALIZATION OF PROGRAMS

A. Analyze the International Focus of Department (Relative to Last Year)

Our M. S. program for Industrial Chemistry has twenty international students from five countries. Currently, an interdisciplinary Ph.D. program is being developed with several departments. This program should enable us to achieve international prominence in educating Ph.D. students given the already international nature of our faculty's research efforts.

The research of our faculty is published in international journals and presentations are made at national and international conferences. The activity of our faculty on an international level can clearly be seen under response to President Goals, #3.

Much of the research conducted by our faculty has an international, as well as national, focus since the journals which our faculty publish in are mostly international in scope.

The following is a list of international projects active in 1995-96:

- (1) Poland - research project between Dr. Henryk Koroniack, Poland and Dr. Otto Phanstiel, UCF.**
- (b) Viet Nam - joint project with Florida Hospital and Viet Nam University. The faculty involved were Dr. Howard Miles, Dr. Barry Schweitzer and Dr. John Francis.**

- (c) The Ukraine - The Chemistry and Physics Departments sponsored a five-week visit by Dr. Alexander Demchenko, Chairman of the Department of Biophysics, Pallidin University and an internationally recognized scientist. Cooperative research projects were set up with Dr. Harry Price, UCF Chemistry Department and Dr. Allfons Schulte, UCF Physics Department.
- (d) Indonesia - Dr. Howard Miles and Dr. Christian Clausen worked with universities in Indonesia on a USAID project to improve their educational system.
- (e) Poland - Cooperative research efforts were established between a polish scientist and Dr. Seth Elsheimer, UCF Chemistry Department.
- (f) Russia - Dr. Kathleen Richardson, UCF Chemistry Department and CREOL, hosted for nine months, Dr. Nikolai Nikonorou, Vavilov State Optical Institute, St. Petersburg, Russia. Research project are ongoing at this time.
- (g) Indonesia, Philippines, Korea - Natural Products Research projects are ongoing with scientists at universities in these countries and Dr. Howard Miles of the UCF Chemistry Department.

The Chemistry Department's B.S. programs in Chemistry and Forensic Science and its Master's program are international in scope. Our M. S. program has twenty international students.

6. CULTURAL DIVERSIFICATION

A. Analyze Cultural Diversification of Department

1. Departmental Activities Relative to Recruitment, Enrollment, Retention, Graduation, and Hiring of Minorities; Plans for Diversification:

Significant progress has been made in increasing the diversity of the faculty. In 1993, Dr. Kathleen Richardson, an outstanding Materials Chemist, was added to our faculty as the first female faculty member. In the fall of 1995, Dr. Harry Price, an African American, joined our faculty from John Hopkins University. He has been able to assist or biomedical research efforts. In the spring of 1996, we added Dr. Cherie Geiger, a native American, to our faculty. Dr. Geiger is an

Inorganic Physical Chemist with specialty in environmental sciences. She will be able to address important research projects dealing with the environment. We interviewed two women for our Assistant/Associate Professor position in Forensic Science, one of which was east Indian. Dr. Ellen Clark was offered the position, but declined due to current job commitments. This position has been reopened and again efforts will be made to assure that diversity will be considered.

Our curriculum, which is certified by the American Chemical Society, is international in scope. Contributions to the field of chemistry have been made by scientists from many cultures and this is pointed out many times in our texts and lectures.

Our student population in all of our programs, B. S. in Chemistry, B. S. in Forensic Science and M. S. in Industrial Chemistry, represent a most diverse group. Of our thirty-seven graduate students, seventeen are women and twenty are international students representing five different countries.

Our curriculum, which is certified by the American Chemical Society, has little room for changes. Any diversity issues would be covered in the GEP program. Chemistry courses are applicable to all cultures and many cultures have played a significant role in the development of Chemistry.

7. PARTNERSHIP ACTIVITIES

A. Analyze Partnership Activities of Department (Relative to Last Year)

The Department continues to be very active in forming partnerships with public agencies and private companies. It is increasingly apparent that federal government agencies such as NSF and NIH, and private granting agencies, cannot meet the growing demand for research dollars. With expertise of our faculty and their desire to work on a wide variety of problems, we have and will continue to work with industry and some other non-traditional sources of support for our faculty and students.

In 1995-96 we continued to work with Florida Hospital from a cooperative team to work on a variety of problems including cancer and tropical diseases. The University is nearing completion of a wide ranging cooperative research agreement with Florida Hospital. Currently, committees composed of Florida Hospital

personnel and UCF personnel are developing procedures that will allow grants to be given from the interest on the endowment provided to UCF by Florida Hospital.

Extensive efforts by members of our faculty to establish a working relationship with the National Forensic Science Center (NFSTC) including the establishment of their academic headquarters in Orlando, are underway. The Board of NFSTC has signed the agreement and now it is ready for signature by President Hitt. This agreement should be very beneficial for the developing of our forensic program and bring considerable prestige to UCF. In addition, the relationship with NFSTC can be of great assistance in our efforts to acquire the Department of Defense and the Department of Justice funding for the Arson and Explosives Institute and other forensic science initiatives.

The establishment of an Arson and Explosive Reference Library in developing partnerships with the Department of Defense and Department of Justice. Work by many at UCF and Florida's delegation in congress should bring this to fruition.

Partnerships which have active ongoing work other than those discussed above are listed below:

1. NASA Contractor- Dr. Brooks Madsen, Dr. Chris Clausen, on two separate projects.
2. Pratt-Whitney - Dr. Chris Clausen and Dr. Michael Hampton.
3. Westinghouse Electric - Dr. Kathleen Richardson
4. Lockheed Martin - Dr. Seth Elsheimer
5. Bionetics - Dr. Brooks Madsen
6. Texas Instruments - Dr. Kathleen Richardson
7. Constar International - Dr. Guy Mattson
8. Rockwell - Dr. Kathleen Richardson
9. Xenon Research - Dr. Guy Mattson

Partnership activities with government and other agencies:

1. ASCLD - American Association of Crime Lab directors - Dr. William McGee, member
2. NASA - Dr. Chris Clausen, Dr. Brooks Madsen
3. Florida Solar Energy Center - Dr. Michael Hampton

4. U. S. Army - Dr. Chris Clausen
5. Center for Optics Manufacturing - Dr. Kathleen Richardson
6. NFSTC - Dr. William McGee and Dr. Glenn Cunningham
7. Florida Hospital - Dr. Glenn Cunningham, Dr. Howard Miles, Dr. Otto Phanstiel, Dr. Harry Price and Dr. Barry Schweitzer.
8. Defense Department - Dr. William McGee, Dr. Glenn Cunningham, and Dr. Christian Clausen.

In addition, our faculty have formed active working relationships with many universities both inside and outside the United States. Foreign involvement is discussed in the previous section.

8. OTHER DEPARTMENTAL ACCOMPLISHMENTS

- A. Symposia, Conferences, Lecture Series Sponsored
(These Accomplishments are Listed in Appendix)**
- B. Innovations or New Programs**

1. Ph.D. program planning

A draft proposal for the Ph.D. program in Applied Chemistry was completed. However, it has been placed on hold in favor of an interdisciplinary Ph.D. program with several departments involved, especially Chemistry from the College of Arts and Sciences and Molecular Biology and Microbiology of the College of Health and Public Affairs. Committees have been established after several meetings to begin the work of this new degree program. A tentative title of Applied Chemical and Biomolecular Sciences has been given to the Ph.D. program with three tracks, (1) Biomolecular Sciences, (2) Materials Sciences, and (3) Environmental Sciences.

2. Institute for Diagnostics and Drug Development -

The Chemistry Department's faculty has played a major role in the rewriting of this interdisciplinary effort. It was one of thirteen proposals presented to our Division of Sponsored Research on June 20th and was selected for stage 2 competition. The Chair has appointed Dr. Howard Miles to work with Dr. Chakrabarti in putting together the stage 2 proposal.

3. New track in Forensic Science - Forensic Serology

C. Quality Improvements

1. The Physical Chemistry laboratory course was under redevelopment by Dr. Price. Several new experiments were added to bring to the classroom advances in this field.

2. Continued improvement of our Biochemistry methods course, BCH 4103L, was undertaken by Dr. Barry Schweitzer to take advantages of his training and modern equipment in the Walt Disney Memorial Cancer Institute.

D. Accomplishments of Centers and Institutes

No centers or institutes are currently housed in the Chemistry Department.

E. Continuing Education Program - None*

F. Distance Learning

The Department's Forensic Science program is working with the National Forensic Technology Center to develop a Master's program to serve among other Forensic Science professionals all over the U.S. Dr. McGee refers to this program as compressed learning. Since Forensic Science is a laboratory science, some laboratory training is involved. All of the effort cannot be distance learning. This effort is still in the planning stages.

We are also developing a relationship with St. Petersburg Community College at USF to potentially offer some of our courses to their students by distance learning.

Finally, when the Arson and Explosives Research Center is underway, there will be an education component which will offer courses by distance learning.

G. Activities in Support of the Dean's Initiatives

1. Technology Across the Curriculum

Chemistry has always been a technology-based curriculum in the laboratory and we have always strived to keep our laboratory instrumentation current. Because of the increased OCO level this year, we will be making significant improvements. When students leave our

program, we want them to be equal to, or better than, any student from any program in the United States.

Technology in the classroom has become a necessity for the Chemistry Department as class sizes have increased (6 at 100-200 students, 3 at 200-300 students, and 6 at 300-500 students). Excellent instruction requires us to do more with technology than before. In the summer of 1995, I appointed a committee, co-chaired by Dr. Michael Hampton and Dr. Kathleen Richardson, and several members of the Instructional Resources staff appointed by Mr. Joel Hartman. The initial goals were to prepare materials for CHM 1020 and CHM 2045. Chemistry 1020 is a very important general education course taught each semester to 300 students in a single section. It is especially tough to teach, in that many of the students have little background or interest in science. We want these students to be excited about science in this course and to be prepared for future everyday interaction with science. Chemistry 2045 is the first course in the science major's sequence and in the fall term it was taught to 500 students in a single section. Significant progress was made in the use of powerpoint based presentation of instructional materials for both CHM 1020 and CHM 2045 and was received well by the students. However, much still needs to be done not only with these courses, but with other courses as well. The use of technology in the classroom remains one of my goals in 1996-97. Dr. Richardson and Dr. Hampton were awarded funds from the Dean's Initiative Award program to continue this effort. The equipment award was matched by Departmental OCO funds. A mobile unit will be developed using a computer-linked video projection system with appropriate software for faculty to develop computer-based instructional materials. Dr. Richardson and Dr. Hampton will help instruct other faculty in the use of this technology in other classes.

2. Diversity and Multi-Cultural Activities

Significant progress has been made in increasing the diversity of the faculty. In 1993, Dr. Kathleen Richardson, an outstanding Materials Chemist, was added to our faculty as the first woman faculty member. In the fall of 1995, Dr. Harry Price, an African American, joined our faculty from John Hopkins University. He is an outstanding biochemist and is an excellent addition to our faculty. In the spring of 1996, we added Dr. Cherie Geiger, a native American, to our faculty. Dr. Geiger is an

Inorganic Physical Chemist with specialty in environmental sciences. We interviewed two women for our Assistant/Associate Professor position in Forensic Science.

Our curriculum, which is certified by the American Chemical Society, is international in scope. Contributions to the field of chemistry have been made by scientists from many cultures and this fact is pointed out many times in our texts and lectures.

The student population in all of our programs, B. S. in Chemistry, B. S. in Forensic Science and M. S. in Industrial Chemistry, represent a most diverse group. Of our thirty-seven graduate students, seventeen are women and twenty are international students representing five different countries.

3. Interdisciplinary Programs

Chemistry faculty have always been involved in interdisciplinary research efforts and have ongoing efforts with Environmental and Civil Engineering, Biological Sciences, Molecular and Microbiology, Biology, Statistics, Computer Sciences and Physics.

In the spring of 1996, a committee was established with faculty from Chemistry, Molecular and Microbiology and Biological Science to develop an interdisciplinary Ph.D. program in Applied Chemical and Biomolecular Sciences. This effort is currently underway with several subcommittees at work.

Drs. Otto Phanstiel, Harry Price, and Howard Miles of the Chemistry Department, are working with Dr. Ronnie Hawkins (Humanities and Philosophy) to develop an interdisciplinary environmental science course.

Several faculty are part of an interdisciplinary institute proposal to be submitted to our Vice President for Research by June 1996 entitled "Institute for Diagnostic and Drug Development."

Our Forensic Science program is developing cooperative interdisciplinary programs with criminal justice program at USF and St. Petersburg Junior College.

H. Progress in Departmental Planning

During the spring of 1996 the departments were asked to develop accountability measure to give a concrete assessment of program

effectiveness. An excellent workshop was conducted by Dr. James Nichols and support documents were given to department Chairs.

The department has decided to extend our study beyond that required by the state. We will carefully examine our B.S. programs in Chemistry and Forensic Science and graduate program in Industrial Chemistry, to assess the effectiveness of our programs in total, as well as component parts. We think we need to ask ourselves a number of questions related to effectiveness, and develop measures that will more concretely allow us to evaluate if we are doing the job we think we are doing in educating students. It is also planned to thoroughly examine our service course and to ask the questions, (a) What are the intended educational outcomes and objectives? (b) Do we have measures to see if we are meeting our educational objectives?

This study will be an ongoing effort involving all of our faculty. It will involve small committees doing their parts and then the whole department in discussing the committee conclusions. We will continue to examine our response to the large increase in students taking chemistry and maximize access to laboratory courses within the limits of resources provided.

The Chemistry Department has always operated with a strong committee structure which operates with some initial charges from the Department Chair. The committee members led by an appointed chair were asked to develop specific goals and action plans with respect to the charges from the Chair or from general faculty meetings. In addition, committee members may include other items they deem appropriate in their deliberations. The following committees were active during this past year:

1. Undergraduate Affairs Committee
2. Graduate Affairs Committee
3. Research Committee
4. Instrumentation Committee
5. Teaching Committee
6. Ph.D. Planning Committee
7. OCO Committee
8. Alumni Relations Committee
9. Student Awards Committee

These committees regularly report to the Chair and in Departmental faculty meetings. At least once a year, a planning session is held in which each committee makes its report and the reports are agreed upon by the Department or sent back to the committee for more study before returning with recommendations which are always presented at faculty meetings. The current SACS report submitted in 1994 is a result of the planning sessions.

I. Other Noteworthy Accomplishments

(These accomplishments are listed in Appendix)

9. PLANS AND GOALS OF DEPARTMENT

A. Summary and Implications of Above

Significant enrollment growth in Chemistry classes has occurred with a 33% increase in FTE production in 1993-94 and another 13% in 1994-95. Since the size of the teaching faculty is almost the same as it was in 1972, our ability to deal with these numbers has been stretched to the limit. Our department has always placed a high priority on teaching and the large increase in student-teacher ratio makes it very difficult for faculty to give quality individual attention. The high demand for lecture classes results in a similar demand for laboratory courses. Because of space and safety concerns, laboratory courses are limited to eighteen to twenty-four students per section, and are expensive in comparison to lecture courses because of the requirement for supplies and instrumentation. Our department realizes the importance of increasing the enrollment of the University and the results of last year's increase in FTE's clearly demonstrates that we have done our part. In 1994-95 eight new lab sections were added including instruction on Saturday. Four upper division lecture classes were added in 1995-96. However, expansion of large lecture section was not possible due to room availability. In addition, state mandates regarding decreasing degree requirements and course funding probably had a negative impact on FTE production. As expected, the Department virtually reached its capacity in FTE production in 1995-96 because of room availability, faculty size and budget constraints.

As reported earlier in this document, this department has made significant research contributions to the University as indicated by the number of research grants, publication, presentations, etc. Even when our faculty have been faced with significant increases in teaching loads, they

have still presented professional papers, written grant proposals, written articles which were published in professional journals, formed partnerships with industry, received funding from national agencies and companies, and directed the research of graduate and undergraduate research students. The Department of Chemistry has always maintained that active research is no better place to teach chemistry than in the research laboratory. This productivity is also being stretched to the limit by the increased demand without proper resources.

Significant progress has been made in increasing the diversity of the department. One faculty, Dr. Kathleen Richardson, was added in 1993, and a second, Dr. Harry Price, an African American, joined us in August of 1995. In August of 1996, Dr. Cherie Geiger, a Native American, will be joining our faculty as Assistant Professor of Chemistry with specialization in inorganic and physical chemistry.

B. Evaluation of Primary Accomplishments in 1995-96

1. Excellence in Teaching

- a. Worked with several faculty members in improving their teaching.
- b. Addressed teaching in all faculty evaluations and in individual meetings with each faculty member.
- c. Nominated Dr. Chris Clausen for the University's Excellence in Teaching award.

2. Excellence in Research and Scholarship

- a. Established clear productivity goals with faculty.
- b. Continued to work on Institute for Diagnostics and Drug Development and an Institute for Arson and Explosives.
- c. Also see item #3 and #5 in President's Five Goals.
- d. Results for 1996 in tangible items:

- 28 publications
- 38 presentations
- Over \$700,000 in funds from agencies and industry

3. Increase Access to Chemistry Classes

Four new lecture sections and three laboratory sections were added in 1995-96. Budget, room availability and faculty availability prevented a greater expansion.

4. Use of Technology for Improving Instruction

See item #1 - Contributions to the Dean's Initiative Program.

5. Establish Industrial Affiliates Advisory Group

Contracts have been made with industry leaders by our committee. However, the meeting of these leaders will not occur until late fall or early winter. My Chair of this committee, Dr. Chris Clausen, was simply too over committed in 1995-96 to put it together as we want to do. In addition, funds for bringing these leaders to UCF in 1996 were not available. I have appointed one of our new faculty members, Dr. Cherie Geiger, to assist Dr. Clausen with the arrangements. Dr. Clausen has met with Dr. Wanielista to talk about their excellent program.

6. Establish an Institute for Diagnostics and Drug Development

The interdisciplinary effort to establish this Institute was successful in stage 1 competitions. It was one of five proposals selected for stage 2 competition. Our committee has already met and have plans underway to accomplish the writing of stage 2 proposal.

7. Implement New Curriculum Track in Forensic Science - Establish New Funding Base for Forensic Science

Actions in 1995-96 on this Goal

The curriculum is in place and over forty students have selected that track. Potential faculty members are currently being interviewed to take the major responsibility for that track and to teach at least two of the new courses. The Department gets a tremendous number of inquiries about this program from all over the U.S.

8. Establish a Federal Reference Laboratory for Arson and Explosives in the Research Park

Actions in 1995-96 on this Goal

A lot of activity occurred in support of this effort. Many proposals were written and rewritten and with advice from several people. \$3.1 million dollars was approved by congress as part of the Defense Bill. Since the approval, Dr. McGee and I, with Dr. Holsenbeck, visited the staff of Congressmen McCollum, Young and Mica. Revisions to the proposal were suggested by staff members and plans are currently being made to get the money released. A letter by the Florida congressional delegation has been submitted to Attorney General Reno of the Department of Justice for second year funding of \$5,000,000. Chancellor Reed has given his support to this project and has ranked it as one of the top federal initiatives in the State of Florida. Cooperative agreements with NFSTC are supporting this

effort along with a consortium of USF and St. Petersburg Junior College. The project is a great undertaking and Dr. McGee has done a tremendous job in developing the idea and keeping the project moving forward.

9. Complete Proposal for Establishing a Ph.D. Program in Applied Chemistry

Actions in 1995-96 on this Goal

A draft proposal for the Ph.D. program in Applied Chemistry was completed. However, it has been placed on hold in favor of an interdisciplinary Ph.D. program with several departments involved, especially Chemistry from the College of Arts and Sciences and Molecular Biology and Microbiology of the College of Health and Public Affairs. Committees have been established after several meetings to begin the work of this new degree program. A tentative title of Applied Chemical and Biomolecular Sciences has been given to the Ph.D. program with three tracks, (1) Biomolecular Sciences, (2) Materials Sciences, and (3) Environmental Sciences.

C. Projections, Plans and Objectives for 1996-97

Excellence in Teaching and Productive Scholarships have always been the hallmark of the Chemistry Department faculty and will remain our number (1) and (2) goals. The specific items listed below support or add to goals 1 and 2. All of the goals below are important, and are not listed in order of importance.

Additional Plans and Goals for 1996-97:

(3) Use of Technology in the Classroom

We will continue efforts to improve teaching through the use of technology in the classroom. Dr. Kathleen Richardson and Dr. Michael Hampton initiated that effort in the summer of 1995 and have made much progress. In the spring, they received a grant from the Dean's Initiative Award program to set up a mobile unit, including computer, projector and other equipment which they can use to prepare teaching material and train other members of our faculty. There are topics in all of the courses that can best be taught using some of the new technology in the classroom regardless of class size. The increase in class sizes has put great pressure on our teaching. Proper use of technology can help offset the change in sizes. Dr. Richardson and Dr. Hampton are valuable resources to assist other members of our faculty.

(4) Accountability and Program Effectiveness

An extensive planning effort is underway in the Department in support of the accountability and program effectiveness initiative. During the spring of 1996 the departments were asked to develop accountability measure to give a concrete assessment of program effectiveness. An excellent workshop was conducted by Dr. James Nichols and support documents were given to department Chairs.

The department has decided to extend our study beyond that required by the state. We will carefully examine our B. S. programs in Chemistry and Forensic Science and graduate program in Industrial Chemistry, to assess the effectiveness of our programs in total, as well as component parts. We think we need to ask ourselves a number of questions related to effectiveness, and develop measures that will more concretely allow us to prove that we are doing the job we think we are doing in educating students. It is also planned to thoroughly examine our service course and to ask the questions, (a) What are the intended educational outcomes and objectives? (b) Do we have measures to see if we are meeting our educational objectives? (c) How can we use these measures to make more improvements?

This study will be an ongoing effort involving all of our faculty. It will involve small committees doing their parts and then the whole department in discussing the committee conclusions. This will be an important part of our planning sessions.

We will continue to examine our response to the large increase in students taking chemistry and maximize access to laboratory courses within the limits of resources provided.

(5) Establish an Agreement with the National Forensic Science Center to Establish Academic Headquarters at UCF

The agreement was signed in the early summer of 1996 and a Director, Dr. William Tillstone, was hired by NFSTC. Dr. Tillstone will have an affiliated appointment as Professor of Forensic Science at UCF. He will be assisting with course offerings, seminars, program planning and research programs. This affiliation should bring our students in contact with the best professionals in forensic science. Many new initiatives are in the planning stages between NFSTC and UCF.

I will work with Dr. McGee in developing an Arson and Explosives Reference Laboratory. We will continue the current initiative working with the Florida congressional delegation to acquire multi-year funding for our plans to develop a reference laboratory with two major focuses, (a) arson and explosives and (2) DNA analysis and related serological techniques.

(6) Increase Departmental Instrumentation

Our instrument base needs to be expanded and aging instruments replaced. Requests are made in the current budget. Through the efforts of Dean Seidel, progress was made and two important instruments were added. Some other progress was made through important start-up funds for faculty. Efforts to replace our aging (old) NMR will be made in 1996-97 with an instrument proposal to NSF. Dr. Phanstiel has been appointed to chair that effort. The lack of a sufficient instrument base was cited as the major deficiency in the Department by the Academic Review team of the Strategic Planning Committee.

(7) Add Excellent Faculty to the Department

Faculty with excellent capability in teaching and research were added to our faculty in 1995-96, Dr. Harry Price and Dr. Otto Phanstiel. Dr. Cherie Geiger will be joining our faculty in August of 1996.

We expect to complete a hire for a new Assistant or Associate Professor of Forensic Science in January of 1997. In the fall we will initiate searches to replace Dr. Beck and Dr. Mattson.

(8) Establish an Institute for Diagnostics and Drug Development

The interdisciplinary effort to establish this Institute was successful in Stage 1 competitions. It was one of five proposals selected for stage 2 competition. Our committee has already met and have plans underway to accomplish the writing of the Stage 2 proposal.

(9) Implement New Curriculum Track in Forensic Science - Establish New Funding Base for Forensic Science

The curriculum is in place and over forty students have selected that track. Potential faculty members are currently being interviewed to take the major responsibility for that track and to teach at least two of the new courses. The Department gets a tremendous number of inquiries about this program from all over the U. S.

(10) Establish a Federal Reference laboratory for Arson and Explosives in the Research Park

Extensive activity has occurred in support of this effort. Many proposals were written and rewritten and with advice from several people. Since the approval, Dr. McGee and I, with Dr. Holsenbeck, visited the staff of Congressmen McCollum, Young and Mica and Senators Graham and Mack. Revisions to the proposal were suggested by staff members and are currently being made to get the money released. A letter by the Florida congressional delegation has been submitted to Attorney General Reno of the Department of Justice for second year funding. Chancellor Reed has given his support to this project and has ranked it as one of the top federal initiatives in the State of Florida. Cooperative agreements with NFSTC is supporting this effort along with a consortium of USF and St. Petersburg Junior College. The project is a great project and Dr. McGee has done a tremendous job in developing the idea and keeping the project moving forward.

In addition, Dr. McGee, Dr. Holsenbeck and I have met with Dr. David Boyd of the National Institute for Justice. The proposal that is being put together by Dr. McGee has been submitted to NIJ and appears to have a good chance for funding.

It appears that the Arson and Explosive Research Laboratory has an excellent chance of being one of the NIJ's six national centers. We will press toward that end. In addition, we will be working with our administration to find suitable space.

(11) Complete Proposal for Establishing an Interdisciplinary Ph.D. Program

A draft proposal for the Ph.D. program in Applied Chemistry was completed. However, it has been placed on hold in favor of an interdisciplinary Ph.D. program with several departments involved, especially Chemistry from the College of Arts and Sciences and Molecular Biology and Microbiology of the College of Health and Public Affairs. Committees have been established after several meetings to begin the work of this new degree program. A tentative title of Applied Chemical and Biomolecular Sciences has been given to the Ph.D. program with three tracks, (1) Biomolecular Sciences, (2) Materials Sciences, and (3) Environmental Sciences.

(12) Establish Industrial Affiliates Advisory Group

For the last two years, the Department of Chemistry has attempted to begin an Industrial Affiliates Advisory group. Detailed plans have been developed and are available to support this goal for the Department. We think the Industrial Affiliates Advisory Group is essential to support the President's Goals for UCF and to support our goals, e.g. establishing an Institute for Diagnostics and Drug Development, establishing an internationally recognized research program, and for support of our M.S. program in Industrial Chemistry and our plans for a Ph.D. program in Allied Chemistry. It is our plan to bring twelve to fifteen representatives of chemical corporations to the UCF campus to acquaint them with our research and teaching efforts for a one and one-half day program. Down-scaling of industry's research staff will necessitate industry turning to universities for research support. During the week of July 22 we met with three officials from Pratt-Whitney about cooperative projects. We want to educate other national corporations about our excellent department faculty and research capabilities. To get industry representatives here, we must offer travel support the first time; otherwise, we think many would not come. Once we get them on campus, we think we can convince them of our capabilities. Since NSF, NIH, PRF, and American Cancer Society funds are so difficult to acquire, other sources are needed to support our teaching and research programs. We think the small investment we have requested in this budget will yield great returns. We already have a committee chaired by Dr. Clausen with detailed plans to implement the Advisory Committee as soon as funds are received. One of our new faculty, Dr. Cherie Geiger, has been added as a Co-chair of this effort.

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I.	Scholarly Activities	
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L Scholarly Activities

A. Published Manuscripts

Dr. Clausen:

- a) C. Geiger, C. A. Clausen, C. D. Cooper, and A. Martinez, "Using Hydrogen Peroxide to Enhance the Thermal Destruction of Dilute Volatile Organic Compounds," Proceedings of the 88th Annual Meeting of the Air and Waste Management Association, June, 1995 p.116.
- b) J. M. Kasper, C. A. Clausen and C. D. Cooper, "Control of Nitrogen Oxide Emissions by Hydrogen Peroxide-Enhanced Gas-Phase Oxidation of Nitric Oxide," J. Air and Waste Management Association 46, 127-133, 1996.
- c) C. A. Clausen, G. Afiouni, A. Hanzo and K. Voss, "Development of Conductive Polymer Fiber Materials for Application as a Degradable Millimeter Wave Screening Agent," Proceedings of the Smoke/Obscurants Symposium XVIII, 1, 369-380, 1995.
- d) C. A. Clausen and X. Y. Duan, "Synthesis and Properties of Millimeter Wave Screening Materials from JP-8 Fuel." Proceedings of the Smoke/Obscurants Symposium XVIII, 1, 381-394, 1995.
- e) P.S. Morgan and C.A. Clausen, "Development of a Multispectral Obscurant Mixture for Explosive Ordnance Disposal (EOD) Applications," Proceedings of the Smoke/Obscurants Symposium XVIII, 1, 407-420, 1995.
- f) C.A. Clausen, "Criteria for Surfactant Selection: "ZONYL, 3' Proceedings of NASA Aqueous Precision, Cleaning and Verification Workshop," 1, 157-188, 1995.
- g) C.A. Clausen, "Final Report on U.S. AID-Higher Education Development Support in Indonesia - To Enhance Undergraduate Chemistry Coursework in Industrial Chemistry." June 8 - July 14, 1995, 500 pages.

Dr. Cunningham:

- a) "Compatibility of Ondansetran Hydrochloride and Amino Acids in a Total Parental Nutrition Solution." *American Journal of Health Systems pharmacy*, 52: 1557, 1995.

Dr. Elsheimer:

- a) S. R. Elsheimer, "Halogenation." Chapter in the book "Chemistry of Organic Fluorine Compounds II," edited by M. Hudlicky and A. Pavlath, American Chemical Society Monograph 187, American Chemical Society, Washington, D. C., 1995.
- b) S. Elsheimer, C. J. Foti, M. D. Bartberger, K-C. Yang, "Reactions of 1,3-Dibromo-1,1-difluoro Compounds with DBU," *Journal of Organic Chemistry*, American Chemical Society.

Dr. Hampton:

- a) M. D. Hampton, "Test Bank to Accompany Brown, LeMay and Bursten, Chemistry, The Central Science. 7th Edition." Prentice Hall, 1996.

Dr. Madsen:

- a) B. C. Madsen, and T. W. Dreschel, "Emission Trends of Sulfur Dioxide and Nitrogen Oxides in Southeastern United States and their Influence on Precipitation Composition." Proceedings of Air and Waste Management Association: Acid Rain and Electric Utilities; Permits, Allowances, Monitoring and Meteorology Conference. Prabhu Dayal, Ed. Air and Waste Management Association, Pittsburgh, PA, 15222. pp. 464-475, 1995.
- b) B. C. Madsen, "Characterization and Evaluation of Acid Rain in East Central Florida from 1978 to 1994 and Evaluation of Some Chromatographic/ Spectroscopic Results from Leachate Samples from CELSS." Final Annual Report. NAG10-0152. NASA, Kennedy Space Center, Florida. November, 1995.

Dr. McGee:

- a) McGee, W. W. and Sanders, C. E. "Three Methods Used for the Differentiation Between the Isomeric Forms of Methamphetamine through the Use of Microcrystal Test and Gas Chromatographic Derivatization." *Journal of Forensic Science*, December 1995.

Dr. Miles:

- a) Santi Tip-Pyang, Odum Kokpol and Howard Miles. "A Search for Agrochemicals from *Plucha indica*, Thai Chemical Society, Journal of Thai chemical Society, October 1995.

Dr. Phanstiel:

- a) R. Bergeron, J. S. McManis, O. Phanstiel, and J. R. T. Vinson, "A Versatile Synthesis of Deferrioxamine B," Journal of Organic Chemistry, American, Vol. 60, pp. 109-114, 1995.
- b) R. Bergeron, G. W. Yao, G. W. Erdos, S. Milstein, G. Gao, W. R. Weimar and O. Phanstiel, "An Investigation of the Impact of Molecular Geometry upon Microcapsule Self-Assembly," Journal of the American Chemical Society, Vol. 117, pp. 6658-6665, 1995.

Dr. Richardson:

- a) P. Hari, P. C. Taylor, K. A. Cerqua-Richardson and W. C. LaCourse, "Nuclear Quadrupole Resonance Studies of As_2Se_3 Fiber," Physical Review B, 51 4 2347-2350, 1995.
- b) E. Munin, A. Villaverde, M. Bass and K. Cerqua-Richardson, "Properties of Solid State Saturable Absorbers based on the Chromium Ion," Journal of Chemical Physical of solids. 1995.
- c) S. Joshi and K. Richardson, "dynamic Hardness Testing of Infrared Materials," NIST Special Publication #896, 1995.
- d) J. McKinley and K. Richardson, "Characterization of Candidate Bonding Glasses for Composite IR Window Structures," Proc. SPIE Vol. 2554. 1995.
- e) C. T. Hach, K. A. Richardson, J. R. Varner and W. C. LaCourse, "Density and Microhardness Variations in Arsenic Selenide Glasses and Glass Fibers," Journal of Non-Crystalline Solids. 1995.
- f) K. Richardson, "Infrared Materials Database," Version 2, Center for Optics Manufacturing, University of Rochester, NY. 1995.
- g) K. Richardson, Contributor to The Science and Engineering Student's Handbook, Magnolia Publishing, Inc. 1996.

Dr. Schweitzer:

- a) **B. I. Schweitzer, K. H. Gardner and G. Tucker-Kellogg, "HeteroTOCSY-Based Experiments for Measuring Heteronuclear Relaxation in Nucleic Acids and Proteins," Journal of Biomolecular NMR 6, 180-188. 1995.**
- b) **S. J. Marshalko, B. I. Schweitzer and G. P. Beardsley, "Chiral Chemical Synthesis of DNA Containing (S)-9-(1,3-dihydroxy-2-propoxymethyl) Guanine (DHPG) and Effects on Thermal Stability, Duplex Structure and Thermodynamics of Duplex Formation," Biochemistry 34, 9235-9248. 1995.**
- c) **D. Callihan, J. West, B. I. Schweitzer and T. M. Logan, "Distortion-Free Homonuclear NMR Spectra of Peptides and Nucleic Acids in Water Using Excitation Sculpting," Journal of Magnetic Resonance. 1996.**
- d) **M. Foti, S. J. Marshalko, G. P. Beardsley and B. I. Schweitzer, "Solution Structure of a DNA Decamer Containing the Antiviral Acyclic Nucleoside Analog Ganciclovir," 1996. Manuscript in preparation.**

B. Scholarly Presentations:

Dr. Clausen:

- a) "Using Hydrogen Peroxide to Enhance the Thermal Destruction of Dilute Volatile Organic Compounds." Presented at the 88th Annual Meeting of the Air and Waste Management Association, San Antonio, Texas, June 18-23 (1995).
- b) "Hydrogen Peroxide Enhanced Oxidation and Removal of Nitrogen Oxides from Flue Gases." Presented at the ACS Emerging Technologies in Hazardous Waste Management VII Symposium, in Atlanta, Georgia, September 17-20 (1995).
- c) "Enhanced Oxidation of Volatile Organic Compounds from Flue Gases Using Hydrogen Peroxide." Presented at the ACS Emerging Technologies in Hazardous Waste Management VII Symposium, in Atlanta, Georgia, September 17-20 (1995).
- d) "Criteria for Surfactant Selection "ZONYL." Presented at the Aqueous Precision, cleaning and Verification Workshop," John F. Kennedy Space Center, October 1995.
- e) "Environmental Catalysts," Presented at the 211th American Chemical Society National Meeting, New Orleans, LA. March 24-26, 1996.
- f) "Remediation of Solvent-Contaminated Groundwater Using Enhanced Zero-Valent Metal Technology." Presented at the 211th American Chemical Society National Meeting, New Orleans, LA. March 24-26, 1996.
- g) "Using Conductive Polymer Coated Filaments as a Multispectral Screening Agent." Presented at the Fifth Annual U.S. Army-British Army Symposium on Obscuration, Baltimore, MD. March 28, 1996.
- h) "The Synthesis of Conductive Filaments from JP-8." Presented at the Fifth Annual U.S. Army-British Army Symposium on Obscuration, Baltimore, MD. March 28, 1996.
- i) Presented twenty-two presentations in Indonesia under the USAID program. July, 1996.

Dr. Cunningham:

- a) "Investigation into the Mode of Action of Naturally Fluorescent Oxadiazoles." American Cancer Society Research Seminars, Florida Division, Orlando, Florida, March, 1996.
- b) "Antitumor Activity of a Group of Novel Pyrroles." American Cancer Society Research Seminars, Florida Division. Orlando, Florida, March, 1996.

Dr. Elsheimer:

- a) "Organofluorine Chemistry at UCF," UCF Chemistry Department Seminar, March 1996.
- b) "Organofluorine Chemistry at UCF," Florida State University Chemistry Department Seminar, Tallahassee, Florida, March 1996.

Dr. Madsen:

- a) "Acid Rain Studies in East Central Florida from the Late 1970's to the Present." National Atmospheric Deposition Program Technical Committee Meeting. October, 1995. Toronto, Ontario, Canada.
- b) "Rain Chemistry in East Central Florida." SLSTP Student Program Seminar. NASA, Kennedy Space Center, Florida. July, 1995.

Dr. Miles:

- a) "National Products from Aquatic Plants of Southeast Asia," University of Ho Chi Minh City and Ho Chi Minh City of Technology, Viet Nam. July, 1995.
- b) "Agrochemicals and Pharmaceuticals from Plants of the Philippines, Thailand, Indonesia and Vietnam," Orlando Section of American Chemical Society. March, 1996.
- c) "A Search for Antithrombin Agents from Indonesian Plants" USAID - Higher Development Conference on Sustainability, December, 1995.

Dr. Phanstiel:

- a) "Synthesis of Metal Chelators for Deoxyhypusine Hydroxylase Inhibition," Florida division of the American Cancer Society Conference, Orlando, Florida. March, 1996.

- b) "The Development of Iron Chelators for Clinical Use," 14th Florida Organic Chemistry Faculty Conference, University of Central Florida, Orlando, Florida. February, 1996.
- c) Presented seminars on "The Development of Iron Chelators for Clinical Use," at Seminole Community College, Sanford, FL and the University of South Florida, Tampa, FL. 1995-96.

Dr . Price:

- a) "Interaction of the Peptide d-(Trp-Ser-Pro-Lys-Lys) with B- and Z-DNA, 19th Annual Cancer Research Seminar, American Cancer Society, Florida Division, Orlando, Florida. March, 1996.
- b) "Development of multiple Drug Resistance in African Trypanosomas," UCF Biology Department. September, 1995.
- c) "Properties of the Transition State and Development of Transition State Analogues," UCF Chemistry Department. September, 1995.
- d) "Use of Fluorescence Spectroscopy to Study Protein dynamics," UCF Department of Chemistry. February, 1996.
- e) "Design and Characterization of Novel DNA-Binding Molecules," University of South Florida. April, 1996.

Dr. Richardson:

- a) "Recording Mechanisms in Photorefractive Materials," CLEO paper CWA-3, Galtimore, Maryland. 1995.
- b) "Characterization of Candidate Bonding Glasses for Composite IR Window Structures," Proc. SPIE, Vol. 1554, San Diego, California. 1995.
- c) "Improving Glass Grindability: Secrets of Glass Science," Annual Meeting of the Optical Society of America, Portland, Oregon. 1995.
- d) "Crystallization Kinetics of Photo-thermo-refractive (PTR) Glasses," Glass and Optical Materials Division Meeting of the American Ceramic Society, New Orleans, Louisiana. 1995.
- e) "Densification of Silica with Applications in Optics Manufacturing," Glass and Optical Materials Division Meeting of the American Ceramic Society, New Orleans, Louisiana. 1995.

Dr. Schweitzer:

- a) "HeteroTOCSY-Based Experiments for Measuring Heteronuclear Relaxation in Nucleic Acids and Proteins; Dynamics and the Problem of Recognition in Biological Macromolecules," Erice, Sicily, Italy. May, 1995.
- b) "Biophysical Studies on a DNA Decamer Duplex Containing the Antiviral Drug Ganciclovir," Southeastern Regional Magnetic Resonance Conference, Tallahassee. December, 1995.
- c) "Structural Characterization of a 3'-Cholesterol Modified DNA Duplex with Anti-Tumor Activity," Southeastern Regional Magnetic Resonance Conference, Tallahassee, Florida. December, 1995.
- d) "Application of Two-Dimensional Homonuclear NMR Experiments Employing PFG Excitation Sculpting to the Study of Oligodeoxyribonucleotides in H₂O." First Annual University of Texas Medical Branch Structural Biology Symposium, Galveston, Texas. March, 1996.
- e) "Biophysical Studies on a DNA Decamer Duplex containing the Antiviral Drug Ganciclovir," Experimental Nuclear Magnetic Resonance Conference, Asilomar, California. March, 1996.
- f) "Biophysical Studies on a DNA Decamer Duplex Containing the Antiviral Drug Ganciclovir," American Cancer Society 19th Annual Seminar of Cancer Research in Florida. Orlando, Florida. March, 1996.

C. Other Creative Activities (Performances, Exhibits, Commissions, Productions)

Dr. Clausen:

- a) Final Report on "U. S. AID-Higher Education Development Support in Indonesia -To Enhance Undergraduate Chemistry Coursework in Industrial Chemistry." 500 page report. July, 1995.
- b) Advisor to Orange County's Hazardous and Toxic Chemical Response Team. 1995-96.
- c) Reviewer for several professional journals.

Dr. Cunningham:

- a) Organized 1996 American Cancer Society seminar, 150 participants. Radisson Airport Hotel, Orlando, Florida.
- b) Discussion Leader - State University System Leadership Conference, Howey-in-the-Hills, Florida. Summer, 1996.
- c) Wrote book reviews.
- d) Wrote progress reports for grants.
- e) Performed grant reviews.

Dr. Elsheimer:

- a) Contributions to final revision of textbook now in production, "Organic Chemistry," Wm. C. Brown Company, 1996.
- b) Assisted Dr. Miles in organizing Florida Organic State-Wide Faculty Conference, UCF. February, 1996.
- c) Reviewer of research proposal for the Petroleum Research Fund.

Dr. Hampton:

- a) Conducted science fairs at area high schools.
- b) Contributor and department representative to Orange County Public Schools, "Partners in Education" Program. 1995-96.

Dr. Kujawa:

- a) Provided geology resource information to local community members.

Dr. Madsen:

- a) Volunteer - Seminole County Dividends Program. Presented talk on "Acid Rain Measurements and Its Effects" to three 7th grade Earth Science classes.

Dr. McGee:

- a) Advisor and consultant to: Public Defender's Offices in Orange and Seminole Counties; Naval Research Laboratory, Orlando, FL, and Texas Research International, Austin, Texas, in matters relating to forensic science. 1995-96.
- b) Provide service on national scale regarding matters relating to forensic science as one of two Co-Chairmen of the Undergraduate Education Standards Committee, American Academy of Forensic Sciences. 1995-96.

Dr. Miles:

- a) Initiated the formal signing of cooperative agreements between UCF and the University of Ho Chi Minh City and the Ho Chi Minh City University of Technology.
- b) Experienced the distinction of being the first American professor since 1975 to be hosted by both of these universities.
- c) Initiated joint research efforts between the University of Ho Chi Minh City, UCF, and the Walt Disney Memorial Cancer Institute of Florida Hospital. These efforts are energetically engaged in a cooperative partnership in plant-cancer research.
- d) Sponsored Dr. Sumaryati Syukur to work on a USAID funded project with Dr. Barry Schweitzer on a project, "The Binding Domain of Human Cancer Proteins."
- e) Coordinated a visit from the President of Indonesia's leading university. This agreement resulted in the signing of a formal cooperative agreement between UCF and the Institute of Technology Bandung.

- f) Assisted in coordinating the signing of agreements between UCF and nine universities in Sumatra, Indonesia.
- g) Organized Florida Organic State-Wide Faculty Conference, UCF, February, 1996.
- h) Consultant to USAID project in Indonesia in December, 1996 (traveled to Indonesia to execute this assignment).

Dr. Phanstiel:

- a) Judge Captain at Orange County Regional Science and Engineering Fair, Orlando, FL, February, 1996.
- b) Judge at 41st Annual State Science and Engineering Fair of Florida. UCF, April, 1996.
- c) Hired by local attorney, Luis Gomez, to serve as expert witness in federal drug trial, Orlando, FL. December, 1995.

Dr. Price:

- a) Judge at Orange County Regional Science and Engineering Fair, Orlando, FL, February, 1996.

Dr. Richardson:

- a) Exhibit of "IR Process Science Projects," Center for Optics Manufacturing Industrial Demonstration. New York, 1995.
- b) Organizer, Materials Research Consortium (MCR). 1996.

Dr. Schweitzer:

- a) Served as reviewer for Biochemistry and Biopolymers journals.

Dr. Trefonas:

- a) Spoke on crystallography, penicillin, drug design to local senior citizen groups.

D. Student Publications, Presentations, and Creative Activities

1. Student Publications

- a) Chris Adams - Thesis, "Differential Pressure Measurement Instrumentation for Evaluation of Hydrogen Storage Compounds, Spring 1996.
- b) Ghassan Afiouni - Thesis, "The Synthesis of Conductive Polymer Filaments," Summer, 1995.
- c) Thad Bowes - Thesis, "The Treatment and Detoxification of Ammonium Bifluoride Waste," Summer 1995.
- d) Daniela Bratescu - Thesis, "New Catalyst systems For the Vapor Phase Synthesis of Carbon Filaments," Summer and Fall, 1995 and Spring, 1996.
- e) Mr. Anthony Diebes - Thesis, "Part I. Examination of a Pyrrole Cyclization Reaction for the Formation of 4-Carbethoxy-2-phenacyl-3-phenyl pyrrole.

Part II. Synthesis of a Series of Novel Pyrrole Analogs that Contain the Diacylhydrazide Group."

- e) Mr. Kartik M. Keertikar - Thesis, "Phenacylation Studies of Highly Functionalized Pyrroles and their Application to the Preparation of Rigidin Derivatives and Analogous Compounds," Spring 1996.
- f) K-C Yang - Thesis, "I. Synthesis of Methacrylate - Terminated Polyethylene, II. Compounds Related to Difluorofulvene and Difluoroheptafulvene," Spring, 1996.

2. Student Presentations

- a) Greg Bougher - Seminar, "Analytical Techniques (Thermal Analysis) Used in Polymer Characterization," UCF Chemistry Department. April, 1996.
- b) Amber Morgan - Seminar, "Cave Chemistry," UCF Chemistry Department. April, 1996.
- c) Joseph Oshanka - Seminar, "Thermal Analysis and Techniques," UCF Chemistry Department. January, 1996.
- d) Jun Qian - Seminar, "Advances in Environmental Supercritical Fluid Extraction," UCF Chemistry Department. February, 1996.

- e) Patrick Toy - Seminar, "Ground Water Contamination (Sources and Means of Remediation)," UCF Chemistry Department. January, 1996.
- f) Tammie Wright - Seminar, "Fiber Optic Chemical Sensors," UCF Chemistry Department. April, 1996.

