1999 ANNUAL REPORT

DEPARTMENT OF PHYSICAL SCIENCES

Delta State University

APRIL 3, 2000
I. Unit Title: Physical Sciences  
School: Arts and Sciences  
Unit Administrator: H. E. Outlaw  

II. Data and information for department:  
Credit Hour Production  

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Enrollment By Major  

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III. Personnel  

Noteworthy activities and accomplishments  
See appendix  
New positions requested with justification  
None  
Recommended change of status (such as promotion/tenure/change in responsibilities)  
Dr. Joe Bentley recommended for tenure.
IV. Degree Program Addition/Deletions and/or Major Curriculum Changes

None

V. Division/Department Goals for 1999-2000

A. Goal #1: Introduce computer technology in the Chemistry and Physics Laboratories (See Laboratory Remediation in the appendix.)

B. Institutional Goal which was supported by this goal:

Provide the resources, facilities and the physical enviromental which contribute to the intellectual, culture, ethical, physical, and social growth and development of the student and of the surrounding community.

C. Expected Results:

With the aid of computer technology, a variety of novel experiments will be introduced into the Physical Sciences laboratories. Students will collect data and explore a range of activities in the computer assisted labs.

D. Evaluation Procedure(s):

Students will write laboratory reports on lab activities and experiments.

E. Actual Results of Evaluation:

Student lab reports were collected and data collected had been provided by computer sensors. Evaluation showed that the computer use had been effective in these labs.

F. Use of Evaluation Results:

Future implementation of computer based labs were planned for future semesters.
A. Goal #2: Provide more opportunities for student/faculty development and research

B. Institutional Goal which was supported by this goal:

Enhance educational experiences at all levels by encouraging student and faculty research and other creative work.

C. Expected Results:

1. Increase the number of students that participate in summer research activities at other universities and institutes.
2. Increase the number of faculty that attend workshops, short courses, and seminars.

D. Evaluation Procedure(s):

Keep records of faculty and student participation in conferences and workshops and compare level of participation in current year to previous years.

E. Actual Results of Evaluation:

Three faculty members and three students attended the Mississippi Academy of Sciences and presented 3 poster sessions. One faculty member presented papers at the Gordon Conference and the Conference on Current Trends in Computational Chemistry. One faculty member and student presented a poster session and paper at the Pittsburgh Conference. This activity represents a 30% increase over the previous year.

F. Use of Evaluation Results:

We will seek to broaden research based activities at other universities/institutes.
VI. Student Outcomes

Major: Chemistry  Degree: BS

Major Bachelor of Science in Chemistry

A. Student Outcomes #1

Department graduates will demonstrate proficiencies in solving problems in basic chemical theory on an exam by the faculty.

B. Expected Results:

All graduates will make a minimum score of 70 or more points on a 100 point senior exam on basic chemical theory.

C. Evaluation Procedure(s):

Analysis of grade distribution on selected standardized ACS and teacher made exams.

D. Actual Results of Evaluation:

Date of the most recent evaluation? 1999

Analysis of grade distribution revealed that the majority of students scored at or above the National Average in most areas.

E. Use of Evaluation Results:

Further analysis of the examination scores revealed a weakness in analytical skills and instrumental methods. As a result, we have redesigned analytical and instrumental courses to better meet the needs of our students.
Major: Chemistry  Degree: BS

Major Bachelor of Science in Chemistry

A. Student Outcomes #2

Graduates will develop proficiencies in the use of AA, NMR, GC/MASS Spectrometry and X-Ray Spectrometry.

B. Expected Results:

Graduates will make a minimum score of 70 percentile on the ACS exam in Instrumental Analysis.

C. Evaluation Procedure(s):

Analysis of grade distribution on selected standardized ACS and teacher made exams.

D. Actual Results of Evaluation:
   Date of the most recent evaluation? 1999

Analysis of grade distribution revealed that the majority of students scored at or above the National Average in most areas.

E. Use of Evaluation Results:

Further analysis of the examination scores revealed a weakness in analytical skills and instrumental methods. As a result, we have redesigned analytical and instrumental courses to better meet the needs of our students.

Major: Chemistry  Degree: BS

Major Bachelor of Science in Chemistry

A. Student Outcomes #3

Graduates will demonstrate proficiencies in research techniques.

B. Expected Results:

Graduates will write a research paper and/or present results at a professional meeting.
C. Evaluation Procedure(s):

Analysis of grade distribution on selected standardized ACS and teacher made exams. Records will be kept on research papers written and presented at professional meetings.

D. Actual Results of Evaluation:
Date of the most recent evaluation? 1999

Analysis of grade distribution revealed that the majority of students scored at or above the National Average in most areas. Seven students presented papers/posters at professional meetings.

E. Use of Evaluation Results:

Further analysis of the examination scores revealed a weakness in analytical skills and instrumental methods. As a result, we have redesigned analytical and instrumental courses to better meet the needs of our students.

Major: Physical Sciences  Degree: MSNA

A. Student Outcome

All graduates of this program will participate in graduate research.

B. Expected Results

All graduates will demonstrate proficiency in working in the chemistry lab.

C. Evaluation Procedure(s)

The department will maintain coursework records showing research completed.

D. Actual Results of Evaluation
Date of the most recent evaluation? 1999

80% of the students demonstrated proficiency in the chemistry lab.

E. Use of Evaluation Results

Department does not anticipate any changes in curriculum since current evaluation indicate students are meeting departmental goals.
Appendix

Unit Budget Plan
Faculty Activity Report
Laboratory Remediation
Industrial Contacts
Projected Budget
<p>| PROGRAM: | General Academic |
| ACTIVITY: | Activity not budgeted |
| LOCATION: | Location not budgeted |
| ACCOUNT: | |
| 61200 Faculty | 457,179.00 | 466,304.00 | .00 | .00 |
| 61400 Clerical &amp; Secretarial | 13,220.00 | 14,215.00 | .00 | .00 |
| 62801 Regular Student Employment | 1,000.00 | 1,000.00 | .00 | .00 |
| 63000 Fringe Benefits | 120,646.00 | 128,422.00 | .00 | .00 |
| 74 Travel | 3,000.00 | 3,000.00 | -0- | .00 |
| 75140 Professional Development Fees | 75.00 | 75.00 | -0- | .00 |
| 75210 Postage &amp; Post Office Charges | 350.00 | 350.00 | -0- | .00 |
| 75220 Telephone Local Service | 6,096.00 | 6,096.00 | -0- | .00 |
| 75230 Telephone Long Distance | 1,180.00 | 1,180.00 | -0- | .00 |
| 75240 Telephone Installation &amp; Maint | 40.00 | 40.00 | -0- | .00 |
| 75250 Cable TV | 100.00 | 100.00 | -0- | .00 |
| 75260 Transportation of Things | 71.00 | 71.00 | -0- | .00 |
| 75350 Rental of Office Equipment | 350.00 | 350.00 | -0- | .00 |
| 75590 Other Rental | 34.00 | 34.00 | -0- | .00 |
| 75620 Repair &amp; Service Buildings-Grounds | 14.00 | 14.00 | -0- | .00 |
| 75660 Maintenance Contracts-Equipment | 1,700.00 | 1,700.00 | -0- | .00 |
| 75690 Repair &amp; Service Other Equipment | 2,987.00 | 2,987.00 | -0- | .00 |</p>
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**Justification:**
*** Delta State University ***
Unit Budget Plan
FY 2001 Budget
AS OF 07-MAR-2000

ORGANIZATION: 03831 Physical Science
FUND: 10 Unrestricted General Fund

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PROGRAM TOTAL:
- Total Revenue: 0.00
- Total Labor: 592,045.00
- Total Expense: 45,908.00
- Total Transfers: 0.00
- Total Net: -637,953.00

FUND TOTAL:
- Total Revenue: 0.00
- Total Labor: 592,045.00
- Total Expense: 45,908.00
- Total Transfers: 0.00
- Total Net: -637,953.00

ORGZATION TOTAL:
- Total Revenue: 0.00
- Total Labor: 592,045.00
- Total Expense: 45,908.00
- Total Transfers: 0.00
- Total Net: -637,953.00
### Delta State University

#### Unit Budget Plan

**FY 2001 Budget**

**AS OF 07-MAR-2000**

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**ORGANIZATION:** 03832 Planetarium  
**FUND:** 10 Unrestricted General Fund

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**Justification:**
ORGANIZATION: 01832  Planeteria
FUND:  10  Unrestricted General Fund

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**PROGRAM TOTAL:**

|          | .00 | .00 | .00 | .00 |
| Total Revenue |     |     |     |     |
| Total Labor   | .00 | .00 | .00 | .00 |
| Total Expense | 4,500.00 | 4,500.00 | .00 | .00 |
| Total Transfers | .00 | .00 | .00 | .00 |
| Total Net     | -4,500.00 | -4,500.00 | .00 | .00 |

**FUND TOTAL:**

|          | .00 | .00 | .00 | .00 |
| Total Revenue |     |     |     |     |
| Total Labor   | .00 | .00 | .00 | .00 |
| Total Expense | 4,500.00 | 4,500.00 | .00 | .00 |
| Total Transfers | .00 | .00 | .00 | .00 |
| Total Net     | -4,500.00 | -4,500.00 | .00 | .00 |

**ORGANIZATION TOTAL:**

|          | .00 | .00 | .00 | .00 |
| Total Revenue |     |     |     |     |
| Total Labor   | .00 | .00 | .00 | .00 |
| Total Expense | 4,500.00 | 4,500.00 | .00 | .00 |
| Total Transfers | .00 | .00 | .00 | .00 |
| Total Net     | -4,500.00 | -4,500.00 | .00 | .00 |
FACULTY ACTIVITY REPORT
1999

HENRY E. OUTLAW

1.0 Grants, Contracts, Research

1. Awarded $10,000 grant from NASA for teacher workshops.

2.0 Service to Others

1. Directed three Crow's Neck Science Workshops involving over 80 elementary and secondary school teachers.

Henry E. Outlaw, Chair
Physical Science Department
SCHOLARLY ACTIVITY REPORT

Name: Joseph A. Bentley  
College: Arts and Sciences  
Department: Physical Sciences  
Rank: Associate Professor  
Date: Mar. 31, 2000

1.0 Teaching Activities:

1.3 Innovative teaching methods.

I completed work on putting my General Chemistry I (CHE 101) lecture notes on the computer in MS Word format in anticipation of converting it to PowerPoint for classroom presentation.

2.0 Scholarly and Creative Activities:

2.2 Professional presentations include:


3.0 Grants, Contracts, Research:

3.1 External grants and contracts:

None.

3.3 Unfunded research or other scholarly activity:

I have continued doing research in quantum mechanics of small molecules. These calculations consist primarily of vibrational eigenvalue calculations and time-dependent wave packet
calculations. We are currently applying these methods to the heavy water molecule (HOD) and are preparing our results for publication.

4.0 Service to others:

4.1 Service to the University:

I continued to serve as the Physical Sciences Faculty Senator. In this role, I have also been a member of the General Academic Affairs Committee of the Senate.

I have continued as the chair of the Academic Computing Committee.

I have continued to be the Physical Sciences Library Liaison.

I have continued in my role as the Physical Sciences Graduate Coordinator.

I served on the DSU Technology Summit.

I served on the Technology Strategic Planning Initiative Committee.

Joseph A. Bentley
Joseph A. Bentley, Ph.D.
Associate Professor

Henry E. Outlaw, Ph.D.
Physical Sciences, Department Chair
March 30, 2000

To: Dr. Richard Myers, Dean  Dr. Henry Outlaw, Chair
School of Arts and Sciences  Physical Sciences Department
215 Kethley Hall, DSU  180A Walters Building, DSU

From: Dr. James A. ("Tony") Scarborough
Professor of Physics
Physical Sciences Department

Subject: Faculty Activity Report, calendar year 1999

1. Teaching Activities
   A. no new courses taught
   B. Slight revisions occur every year in the general physics sequences
      Phy 221, 222, 231, 231. Noticeable changes are incorporated on a regular
      basis every semester in Phy 205, Astronomy, due to new discoveries as
      the subject area develops. Significant and substantial modifications
      are made every semester in Phy 123, Science and Pseudoscience, since
      this course concentrates on the frontier areas of science (including
      topics which might turn out to be pseudoscience) in which the state of
      knowledge changes constantly.
   C. In Phy 123, I attempt to have persons who have experienced fringe area
      phenomena (such as the "Near-Death Experience") attend my class and
      tell about their experiences. The class then has an opportunity to
      question such people first-hand before forming their opinions about the
      reality or authenticity of the reported events.
      In addition, I have taken groups of ten to twelve students to the
      Ozark UFO Conference in Eureka Springs, Arkansas, every April for the
      past few years. The conference organizers have formerly allowed any
      DSU student to attend the entire conference for a registration fee of
      $20. Beginning in April of 2000, all Delta State students will be
      admitted free of charge to the entire proceedings. The students get to
      hear, and to interact with, various speakers whom they have sometimes
      seen on TV.

2. Scholarly and Creative Activities
   A. I presented a paper entitled "Angels and Aliens" at a conference of the
      same name in Memphis in October, 1999.
      In addition, I presented a talk at the Ozark UFO Conference in
      Eureka Springs, Arkansas, in April, 1999.
      (In recent years, I have focused my research efforts on the overlap
      area between science and religion.)
   B. (i) attended several workshops at the at the UFO-related conferences
       which I have attended
       (ii) attended Ozark UFO Conference with about twelve students
       (iii) attended various other conferences, such as the Mississippi
            Academy of Sciences and the Mississippi Association of Physicists

3. Service to Others
   A. routine committee assignment.
   B. have served as Mississippi State Director for MUFON, the Mutual UFO
      Network, an international investigative organization, since 1990.
   C. was invited speaker to several civic clubs and church groups
   D. evaluated grant proposals for the IHL
4. Grants, Contracts, Research
   A. continued studies on the development of early Christianity in collaboration with others, especially Clint Tibbs at American Catholic University
   B. researching the alleged UFO abduction scenario with Dr. Rex Haire, psychologist, and others

5. Awards, Honors, and Other Recognition
   invited speaker and participant at three UFO related conferences in 1999

Faculty member: [Signature]  Date: March 30, 2000

Department Head: [Signature]  Date: 3/30/2000
FACULTY ACTIVITY REPORT

NAME: Jill H. Harper
COLLEGE: Arts and Sciences
DEPARTMENT: Physical Sciences
RANK: Chemistry Instructor
DATE: March 31, 2000

1.0 Teaching Activities

Spring 1999 - Fall 1999

Continued revisions on chemistry 103 and 104 lab packets
Supervision of new laboratory assistants

2.0 Scholarly and Creative Activities

Math 205 (Fall, 1999)

3.0 Grants, Contracts, Research

None

4.0 Service to Others

Energy Conservation Committee, Chair
Elliot Committee Member
Chemistry Award Honorees (Spring, 1999)
General Chemistry Laboratory Coordinator

5.0 Awards, Honors, and Other Recognition

AED Honor (Spring, 1999)

6.0 Other Activities to be considered in Evaluation

None

Jill H. Harper
Chemistry Instructor

Henry E. Outlaw, Ph.D.
Physical Sciences, Department Chair
FACULTY ACTIVITY REPORT

Submitted by: Carlyisle Meek
Assistant Professor
Department of Physical Sciences
March 30, 2000

1.0 Teaching Activities

Revised laboratory exercises for PHY 233 and 234 to include new computer-based experimental procedures and new computers purchased by grant.

Developed and taught a pre-college chemistry review course for minority students who were to be incoming college freshmen in the fall of 1999. This course was part of a Mississippi Alliance for Minority Participation (MAMP) grant program.

Taught the physics portion of the new MCAT preparation class being offered to pre-med students at DSU.

Designed and taught a new continuing education physics course at night for non-traditional students.

Developed and taught two workshops on physics at Crow's Neck Environmental Center designed to help elementary and junior high teachers who need more physical science experience.

Taught two workshops in chemistry at Crow's Neck Environmental Center for elementary and junior high teachers.

2.0 Scholarly and Creative Activities

Continued working on dissertation through Mississippi State University, completing additional dissertation research hours as required by my doctoral program.

Attended ArcView remote sensing training workshop becoming certified in the use of ArcView programs in remote sensing.

Attended computer training course in the use of Microsoft Powerpoint software.

Arranged for the donation of some $125,000 worth of mounted animal specimens to the Delta State University Natural History Museum. As part of this effort, I located the potential donors, arranged for collection appraisals, found the funding for shipping costs, and set up in the museum the first part of the collection. I hope to complete the refurbishment of the museum and hang the rest of the collection by the end of the spring semester, 2000.

Was interviewed by Public Radio in Mississippi (PRM) on the installation and use of remote sensing technology on the Delta State campus.
3.0 Service to Others

Organized and directed a remote sensing training session here at DSU for faculty members needing ArcView software training. Some fourteen of our faculty were trained, and I also arranged for faculty from Mississippi Valley State University, Coahoma Community College, and Mississippi Delta Community College to participate in this training workshop.

Organized a remote sensing banquet for faculty members and Delta community leaders that included a presentation by the director and workforce coordinator of the Mississippi Space Commerce Initiative (MSCI).

Arranged for the installation of ArcView software on the computers of DSU faculty members who requested it.

Attended a meeting at IHL with representatives of the four-year and community colleges where I was designated as the legally responsible person at DSU for the dissemination of state-licensed remote sensing software.

Represented Delta State University on the IHL Remote Sensing Council. This group consisted of one representative from each of the eight major universities as well as representatives from the University of Mississippi Medical Center and NASA.

Represented Delta State University on another committee focused on remote sensing comprised of representatives from north Mississippi community colleges, state business leaders, Mississippi State University, and NASA.

Began revising the physical science departmental NCATE submissions.

Served on the faculty Energy Committee.

Worked with science fair entrants and made physics presentations to local school classes at the request of local teachers.

4.0 Grants, Contracts, Research

Participated in a $6,000,000 NASA grant to promote remote sensing throughout the state of Mississippi. This grant is administered by NASA and IHL and is in its second year of actual work. The goal of this program is to bring remote sensing technology to all the major university campuses in the state and set up a network connecting community colleges, secondary schools, and the universities which will allow Mississippi to become a national leader in the training of professionals in remote sensing.

5.0 Awards, Honors, and Other Recognition

Was elected to serve on the governing board of the Mississippi Association of Physicists.

Signed: [Signature]
Head of Department

Signed: [Signature]
Faculty member
1. Teaching Activities
   Classes Taught:
   - Fall 1999
     - Che 102
     - Che 103
     - Che 311
     - Che 313
   - Spring 2000
     - Che 102
     - Che 434
     - Che 460
     - Che 534
     - Che 560

   ➢ Wrote new lab manuals for Che 311 and Che 460
   ➢ Redesigned Analytical Chemistry curricula to incorporate use of computer spreadsheet and graphing programs in several laboratory experiments.
   ➢ Introduced several cooperative learning activities involving group problem solving sessions for both the freshman chemistry and quantitative analysis courses.
   ➢ Added library research and oral presentation components to instrumental analysis and environmental chemistry courses to enhance the student’s library search skills, to give the students practice reading and evaluating scientific papers in the literature, and to give the student’s experience presenting scientific information to their peers.

2. Scholarly and Creative Activities
   ➢ Attended American Chemical Society: Mississippi Mid-Winter Symposium, Jackson, MS, January, 2000.
   ➢ Attended Workshop on Securing Support for Undergraduate Research (Sponsored by NSF) and PRF Proposal Preparation Workshop at the American Chemical Society Southeast Regional Meeting, Knoxville, TN, October, 1999.

3. Service to Others
   ➢ Presented “Mathematics – The Language of Science” for Jason Project Teacher Training Workshop held at DSU (workshop directed by Eric Helms).
   ➢ Member of the Department of Physical Science’s Health and Safety Committee.
   ➢ Member of the Department of Physical Science’s Technology Committee.
   ➢ Initiated a lab clean-up and disposal of legacy waste that had accumulated in the analytical labs during a previous faculty member’s tenure.

4. Grants, Contracts, and Research
   ➢ Acquired electrochemistry instrumentation and set up testing apparatus to do research on fuel cell catalysts for direct methanol fuel cells.
   ➢ Directed undergraduate research project to test for nicotine content in various brands of cigarettes using ultraviolet spectroscopy.

5. Awards, Honors, and Other Recognition
   ➢ Awarded U.S. Patent #6,001,248 on December 14th, 1999. “Gradient Interface Magnetic Composites and Systems Therefor”, co-authors: Johna Leddy and Sudath Amarasinghe

Lois Anne Zook
Assistant Professor of Chemistry

Henry E. Outlaw
Chair, Department of Physical Sciences
Name: Eric Helms
Title: Assistant Professor of Chemistry
Department of Physical Sciences

Faculty Activity Report

1. Teaching Activities

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2. Scholarly and Creative Activities

--Attended the Jason Project XI National Educators Conference in Milwaukee, WI.
--Continued rewriting departmental web pages to better serve student needs.
--Submitted paper to Bioorganic and Medicinal Chemistry Letters.
--Completed ‘Introduction to ArcView GIS’ course.

3. Service to Others

--Planned and implemented Teacher Training workshops for the Jason Project; two held at DSU, one held at Coahoma CC.

5. Awards, Honors, and Other Recognition

--AED Honors

[Signature]

Eric D. Helms
Assistant Professor of Chemistry

[Signature]

Henry E. Outlaw
Chair, Department of Physical Sciences
Teaching Activities
- Summer 1999 – Instructor for Eisenhower Prof. Development Program for Science/Math Secondary Teachers (Grant)
- Fall 1999 – Instructor for two sections of Astronomy (PHY 205)
- Finished trailer section of Physics for the Life Sciences and Lab.
- Biophysics – Phy 400
- Spring 2000 – Two sections of Astronomy (PHY 205)
- Spring 2000 Topics in Physics course – 1 hr seminar on Relativity

Scholarly and Creative Activities
- Astronomy course continues with internet site and online archive.
- Presented seminar at Mississippi Science Teachers Assoc.
- Attended Mississippi Academy of Sciences.
- Introductory Astronomy activities for Crow’s Neck attendees.

Service to Others
- Since September 1999 – approximately 40 Planetarium Shows to educational and public groups ranging from preschoolers to retirees (includes DSU GST classes)
- Traditional Christmas Show to public Sundays in Dec. 1999 (with thanks to B. G. Tatum).
- Spring 2000 – Continuing Ed course in basic Astronomy.

Grants, Contracts and Research
- Principal Investigator with DSU for Eisenhower Professional Development Program, a $322,836 grant collaboration among University of Mississippi, DSU, and Mississippi Valley State University (has been renewed for 2000-2001).
- New equipment for broadening physical/biological sciences focus of above for 2000 summer.
- Hosted 4 Teacher Alliance Meetings

David W. Craig, Ph.D.
Asst. Professor of Physics and Planetarium Director

Henry E. Outlaw, Ph.D.
Department of Physical Sciences, Chair.
Name: Marcus L. Steele

Title: Professor

Department of Physical Sciences

FACULTY ACTIVITY REPORT

1.0 Teaching Activities

(1) Dr. Steele has effectively administered the lecture and laboratory portions of the traditional load of undergraduate and graduates courses each semester.

(2) Dr. Steele has maintained viable, independent study projects with two or more students each semester.

(3) Dr. Steele has revised the lecture portion of CHE 301, Inorganic Chemistry as the previous text was discontinued by the publisher.

2.0 Scholarly and creative activity

Dr. Steele has been involved in following creative activities this academic year:

Grant Proposals
(1) $200,000 proposal to EPA entitled "Biomass Sustainable Development Through Chemical Tire Recycling, Collaboration with Jackson State and USM, pending
(2) $158,570 proposal to NASA for a Delta Summer Research Institute for Minority Science Students, not funded
(3) $21,440 proposal to Environmental Protection Agency for a Pesticide Awareness Workshop for High School Teachers in the Mississippi Delta, not funded

Publication

Presentations

Manuscript Reviewer
(2) Manuscript reviewer for Journal of Agricultural and Food Chemistry.

3.0 Service to Others
(1) Served as Pre-pharmacy advisor
(2) Served on three Doctoral (Education) and two Masters (Biology) committees.
(3) Served as an advisor for Science Fair projects.
(4) Member Mississippi Academy of Sciences
(5) Member American Chemical Society (received fountain pen for 25 year service)

4.0 Grants, Contracts, Research
(1) Research Contract, USDA, 1999-2000, $ 35,000
(2) Summer Student Research Internship, MAMP (NSF), $2800

Respectfully Submitted,

Marcus L. Steele, Ph.D.
Professor

Henry E. Outlaw, Ph.D.
Physical Sciences, Departmental Chairman
**PHYSICAL SCIENCE LABORATORY REMEDIATION**

### Major Laboratory Equipment

<table>
<thead>
<tr>
<th>Item</th>
<th>Approximate Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Chromatograph/Mass Spectrometer (Hewlett Packard)</td>
<td>$ 75,000</td>
</tr>
<tr>
<td>NMR upgrade to Fourier Transform</td>
<td>$ 53,000</td>
</tr>
<tr>
<td>High Performance Liquid Chromatographic System</td>
<td>$ 40,000</td>
</tr>
<tr>
<td>Ultraviolet/Visible Spectrophotometer (Diode Array Detector)</td>
<td>$ 30,000</td>
</tr>
<tr>
<td>Basic Gas Chromatographs (3) (Organic Lab)</td>
<td>$ 13,000</td>
</tr>
<tr>
<td>Johnson Matthey Balance for Magnetic Susceptibility</td>
<td>$ 10,000</td>
</tr>
</tbody>
</table>

$221,000

### Basic Laboratory Equipment

<table>
<thead>
<tr>
<th>Item</th>
<th>Approximate Cost</th>
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</thead>
<tbody>
<tr>
<td>Analytical Balances (8)</td>
<td>$ 16,000</td>
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<tr>
<td>Top-loading Balances (10)</td>
<td>$ 10,000</td>
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<tr>
<td>pH Meters (10)</td>
<td>$ 5,000</td>
</tr>
<tr>
<td>Stirring Hotplates (10)</td>
<td>$ 3,000</td>
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</tbody>
</table>

$34,000

**Total** $255,000
Industrial Contacts

February 2, 2000

Don Aylward – Rosedale, MS

Don recommended that DSU contact Laser Plane about providing students with GIS/GPS training for opportunities in Precision Agriculture.

JESCO (Lynn Sullivan, DSU chemistry graduate), Rosedale, MS

Lynn, employed as a chemist, showed us around her lab and the manufacturing facility. Their main product is grease for cottonpicker spindles. They produce grease by combining refinery oil with soap. The soap is made by combining LiOH with fatty acids. Most of the qualitative tests that Lynn performs are physical tests such as viscosity and ball penetration tests.

David Humphrey, a DSU chemistry graduate, is head of their research department in Kansas City, MO. David will be contacted to offer assistance from the Physical Science Department in producing new products or eliminating problems in the present procedure.

February 14, 2000

Laser Plane (Keith Luna), Cleveland, MS

Mr. Luna, local manager, was contacted concerning any assistance we could provide his company especially relating to GIS/GPS. He said that at the present his company is backing off in this area because he believes that another local company, Sanders Seed, has already taken control of this area in the local farming market.

Laser Plane will have a national inter-company meeting the first of March. If their position in GIS/GPS changes at that time he will contact us.
February 16, 2000

Delta Pineland (Kim Nasser, DSU chemistry graduate), Scott, MS

Kim showed us her lab and an adjoining germination lab. Kim has a computer-controlled HP 5890 Series II Gas Chromatograph with an flame ionization detector and an autosampler in her lab, but presently replaced its applications to a large extent with immunoassay techniques (ELISA). She has a Biorad reader for the immunoassay samples. The germination lab assesses the quality of their seed (primarily cotton) by placing about 20 seeds in wet towels, rolled, secured with rubber bands, and stored from 3-7 days in thermostatted walk-in "ovens". At the end of the appropriate time (3-7 days), the towels are unrolled and the number of seed that have roots that are 11/2 in. or longer are counted and the per cent germinated seed is established.

March 22, 2000

Cooper Tire (Fred Doster, a DSU nontraditional chemistry undergraduate), Clarksdale, MS

Fred Doster is Mark Steele’s advisee. Fred, employed as the plant chemist, gave a detailed tour of the tube production at the facility and the qualitative analysis lab. We were introduced to the plant manager and the manager of technical development. Most of the quality control test were physical test that evaluated the elasticity of the final product, tire tubes, and the and quality of the valve cementing procedure. The establishment of an internship program with DSU undergraduates was suggested by the manager of technical development and is being explored by Cooper Tire management.
### Physical Science Department 2000-2001 Budget Request

<table>
<thead>
<tr>
<th>Item</th>
<th>1999-2000 (Actual)</th>
<th>2000-2001 (Requested)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockroom/maintenance Personnel (halftime)</td>
<td>10,000.00</td>
<td>2,670.00</td>
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<tr>
<td>Total Labor</td>
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<td>623,211.00</td>
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<td>Travel</td>
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<td>$3000.00</td>
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<tr>
<td>Contractual Services</td>
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<tr>
<td>Professional Development Fees</td>
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<td>Contractual Services</td>
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<td>Postage</td>
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<td>Telephone (local)</td>
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<td>Telephone (long distance)</td>
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<tr>
<td>Telephone Installation and Maintenance</td>
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<tr>
<td>Cable</td>
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<td>Transportation of Things</td>
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<tr>
<td>Rental of Office Equip.</td>
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<tr>
<td>Maintenance Contracts (Equipment)</td>
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<tr>
<td>Repair &amp; Service (Equipment)</td>
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<td>5,000.00</td>
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<tr>
<td>Other Professional Fees &amp; Services</td>
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<tr>
<td>Dues</td>
<td>180.00</td>
<td>180.00</td>
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<tr>
<td>Subscriptions</td>
<td>169.00</td>
<td>169.00</td>
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<tr>
<td>Description</td>
<td>Budget 1</td>
<td>Budget 2</td>
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<tr>
<td>------------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Computer Software</td>
<td>1,500.00</td>
<td>2,500.00</td>
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<tr>
<td>Total Contractual</td>
<td>15,313.00</td>
<td>18,326.00</td>
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<tr>
<td>Direct Expenditures</td>
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<td>Commodities</td>
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<tr>
<td><strong>Duplication</strong></td>
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<tr>
<td>Office Supplies</td>
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<tr>
<td>Instructional Materials</td>
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<tr>
<td>Lab &amp; Testing Supplies</td>
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<tr>
<td>Food for Persons</td>
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<tr>
<td>Other Supplies &amp; Materials</td>
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<tr>
<td><strong>Scientific Equipment</strong></td>
<td>4,000.00</td>
<td>10,000.00</td>
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<tr>
<td>Direct Expenditures</td>
<td>47,088.00</td>
<td>56,101.00</td>
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<tr>
<td><strong>Total Budget</strong></td>
<td>657,629.00</td>
<td>697,638.00 (6.084% inc.)</td>
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</tbody>
</table>