

# OKLAHOMA ALLIANCE FOR MINORITY PARTICIPATION IN SCIENCE, MATHEMATICS, ENGINEERING AND TECHNOLOGY

## 1998 Report for Performance Effectiveness Review

to  
Division of Education and Human Resource Development  
Alliances for Minority Participation

at  
NATIONAL SCIENCE FOUNDATION  
ARLINGTON, VIRGINIA

30 October 1998

prepared by  
J.M.Batson

---

PI/PD

**Earl D. Mitchell, Jr.**  
ldsilva@okway.okstate.edu

DATE

---

Fiscal Officer TYPED NAME & SIGNATURE

**Thomas C. Collins**  
Collins@okway.okstate.edu

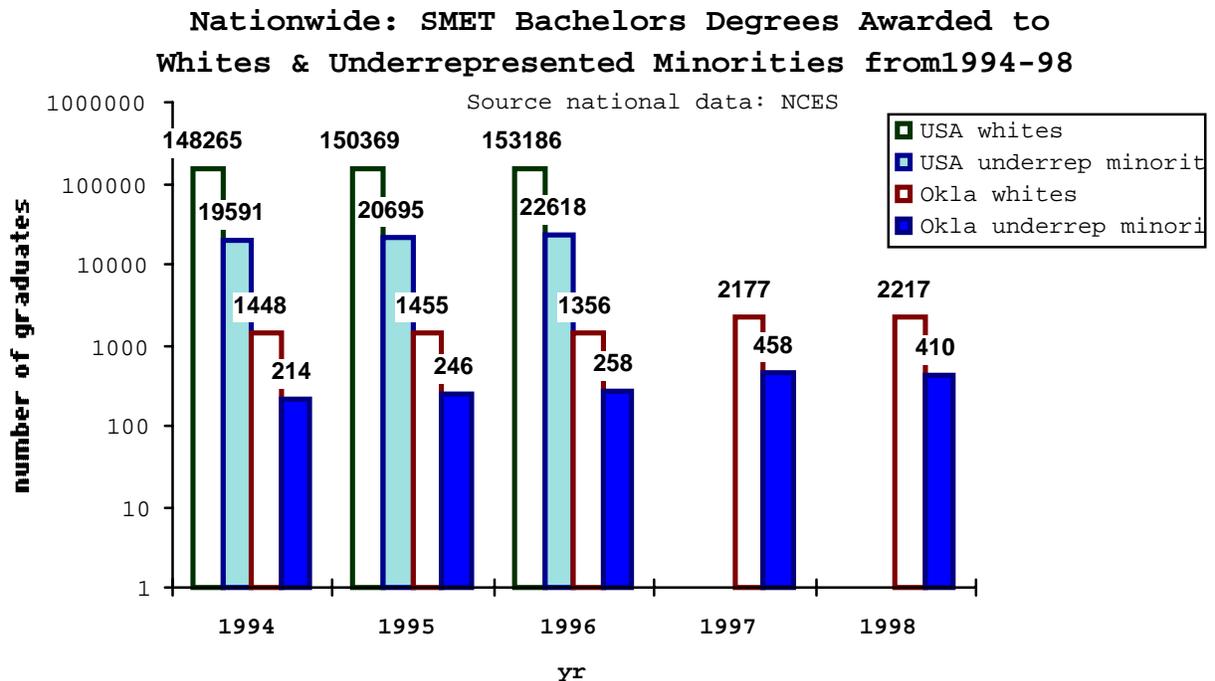
DATE

Oklahoma Alliance for Minority Participation  
"PROGRAM EFFECTIVENESS" REVIEWS (PE.R.)  
October 30, 1998  
The National Science Foundation  
4201 Wilson Blvd. ROOM 815

**I. PROGRAM PERFORMANCE.**

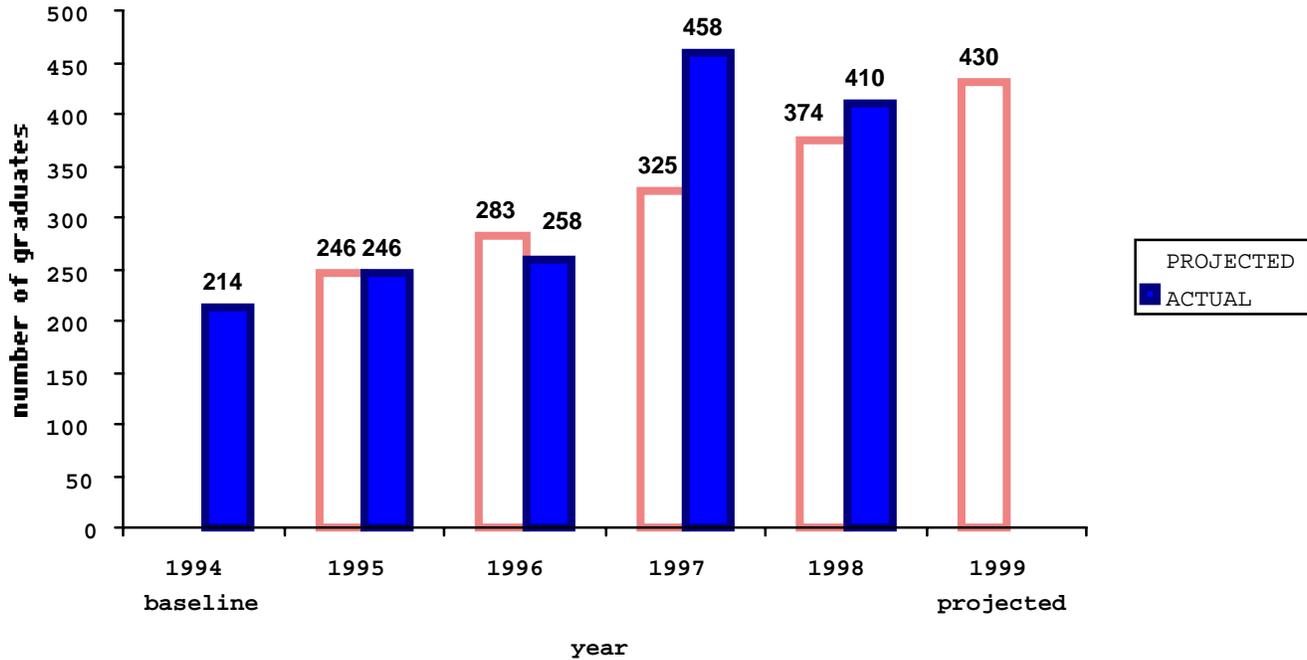
**National.** The annual nation-wide growth in baccalaureate degrees earned by underrepresented minorities \*(Native American, African-American, Hispanic) in SMET fields has progressed steadily when compared to whites by 5.3% from 1994 to 1995 and by 8.5% from 1995 to 1996. Overall increases by only 1.9% and 2.7% were seen for the combined pool of whites and underrepresented minorities from 1994 to 1996 (Figure 1.). Among white SMET students nationally, gains averaged only 1.6% from 1994-96.

**Figure 1.**



**Oklahoma AMP.** In comparison, the annual growth in the number of minority undergraduate degrees conferred in the Oklahoma continues to outpace the national course. This is largely due to the efforts of the Oklahoma Alliance for Minority Participation, which in 1994 proposed a 15% annual increase from a baseline of 214 degrees awarded to underrepresented students in SMET. The noticeable growth in Bachelor's Degrees conferred in SMET fields to underrepresented minority populations \*(Native American, African-American, Hispanic only; not including Native Pacific Islanders) began in 1995 with an initial increase from the baseline by 13% (n=246). This was followed by a modest 4.6% increase in 1996. And, in 1997, a remarkable surge of 43.6% (n=458) was seen. The following year, the projected growth pattern resumed but the 410 new SMET degrees earned in 1998 still exceeded the predicted increase by 36 degrees awarded. Figure 2. illustrates the changes since 1994.

**OKLAHOMA ALLIANCE: MINORITIES AWARDED B.S.  
DEGREES IN SMET FIELDS  
(with yearly projections from 1994 baseline)**



**Figure 2.** Source raw data:UDS, OSRHE

1998 counts reflect a change in approved CIP codes designating approved major fields. This change had the greatest negative impact on the number of degrees reported for Native Americans. In conclusion, overall progress is steady, by proportion of degrees earned and gains as projected from the baseline.

**Table 1. Proportion of Degrees earned in SMET by target group**

| Table       | African-American | Native American | Hispanic  | White       | Total Minority     | Grand Total |
|-------------|------------------|-----------------|-----------|-------------|--------------------|-------------|
| 1997        | 149              | 389             | 79        | 2177        | 458 (17.3%)        | 2635        |
| <b>1998</b> | <b>115</b>       | <b>228</b>      | <b>67</b> | <b>2217</b> | <b>410 (15.6%)</b> | <b>2627</b> |

Source raw data:UDS, OSRHE

**II. "VALUE ADDED" for INTER AND INTRA-INSTITUTIONAL PROGRAMMING and COHERENCE.** This is reviewed through Common Components, Shared Resources and Coherence.

Common Components, The inter-institutional collaboration among the eight Partner universities, Affiliate institutions and other entities comprising OKAMP-SMET continues to serve as a catalyst for establishing broader and more productive ways to improve the quality of undergraduate minority participation and success in SMET. Student retention, enhanced academic performance and preparedness for advanced scholarly activities are the primary objectives effected through (1) **the Summer Bridge Program,** (2) **Semester Scholars Programs** and (3) **Research Internship Programs.** Through cooperative efforts OKAMP-SMET strives to connect these undergraduate programs with Oklahoma's K-12

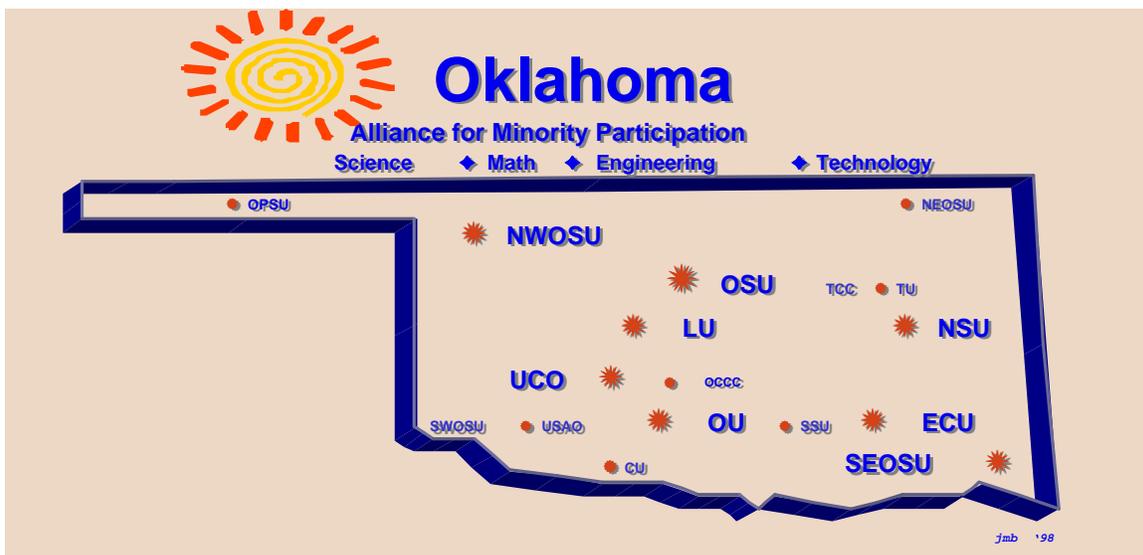
education system, graduate school programs and the SMET workforce development activities.



**Figure 3.** SMET Continuum

All three essential OKAMP Programs are provided throughout the state by OKAMP Partner institutions. The Partners are East Central University (ECU), Langston University (LU), Northeastern State University (NSU), Northwestern Oklahoma State University (NWOSU), Oklahoma State University (OSU), Southeastern Oklahoma State University (SEOSU), the University of Oklahoma (OU), the University of Central Oklahoma (UCO). The map at Figure 3. shows the distribution of Partner universities and selected Affilliate campuses.

**Figure 4.** Geographic Distribution of Alliance Institutions



**Shared Resources - Inter- and intra-institutional.**

Inter-institutional features across OKAMP:

- Recruitment and retention activities
- Affiliate Scholars via Cooperative Agreement
- Graduate School preparation activities and research mentors
- Centralized program and data management

- ⇒ All Partners offer a central student support program appropriate for "real time" tracking, scholastic development, peer networking and close mentoring.
- ⇒ A Bridge program serving the entire Alliance is offered in cooperation with the Oklahoma State Regents for Higher Education
- ⇒ OKAMP staff assist Scholars with identifying and competing for possible research and supplemental award opportunities.

Graduate School preparation information workshop for OKAMP students was available through the graduate college. The facilitator, Dr. Molly Tovar, offers similar presentations to OKAMP Partner institutions.

- ⇒ The lead Partner institution is resource center for other Partner Programs. Dynamic Bridge, Scholars and Research Internship Model Programs are all maintained at the resource center institution to provide a constant mechanism for continual evaluation, innovative and improvement of academic programming for minority SMET students. The lead Campus Coordinator, along with the Program Manager and Project Director, regularly share the outcomes and ideas generated through the Model Programs with Partner staff and others who work directly with Scholars.
- ⇒ Other programs and initiatives actively sought to collaborate with OKAMP-SMET Programs in 1998. A few notable examples are:
  - OPBS - the Oklahoma Partners for Biological Sciences. Howard Hughes Foundation.
  - NABS - Native Americans in Biological Sciences. Howard Hughes Foundation.
  - EPSCoR - the Experimental Project to Stimulate Competitive Research
  - The McNair Scholars Program, ECU, Ada, OK
  - The McCabe Scholars Program, Langston
  - Rural System Initiative Proposal development team
  - Minority Engineering Programs, University of Oklahoma and Oklahoma State University
  - The Psychology Diversified Student Program
  - The Center for Tribal Studies, Tahlequah, OK
  - Native American Counseling Program, ECU, Ada, OK
  - The Oklahoma School for Science and Mathematics

**Specific accounts of program components, resources shared across the collaborative and evidence of the strategic use of NSF resources and are best presented in the context of the three program components. The student support programs are the focus of the OKAMP-SMET initiative and components and resources shared can only be pointed out through detailed descriptions of activities as follows.**

Summer Bridge Programs. In 1998, the program was funded entirely through a grant from the Oklahoma State Regents for Higher Education. There is no equivalent state-supported advance start program for college bound underrepresented minority students in many disciplines and serving multiple institutions.

- ⇒ All Partners participated in the distribution of applications in their region.
- ⇒ The record for diverse representation was continued with students declaring the intention to attend the University of Oklahoma, the University of Central Oklahoma, Langston University, Oklahoma State University, the University of Science and Arts of Oklahoma.
- ⇒ Referrals for Bridge Scholars to continue in the semester Scholars Program are provided to the Partner institution of choice. Affiliate Bridge Scholars participate via Cooperative Agreements with their college.

- ⇒ East Central University, Co-PI, Dr. Carl Rutledge, served as the official Bridge Program applications receiving-site. Bridge Program selection was composed of coordinators from Partner schools.
- ⇒ Standard admission and processing procedures were instituted. Prior to officially entering the program, Bridge Scholar finalists are given an academic assessment and other intake related services by the university Admissions offices. An OKAMP Bridge Program Orientation and Enrollment Workshop for participants and their families is required.
- ⇒ Residential life services were routinely provided by university personnel. The residence hall assistant was orientated to the OKAMP program and special accommodations were made for "visiting" OKAMP Scholars.
- ⇒ Programming again involved many different university departments. Mathematics and English departments offered courses and provided specific academic support. The colleges of Engineering and Arts and Sciences provide programs on majors and career options. The Math Learning Resources Center, Library, Multicultural Development and Assessment Center all presented programs to OKAMP Scholars. A Forum with continuing college student in SMET was held.
- ⇒ The OKAMP Bridge Program is now regarded as a reliable prototype for similar programs to be developed across the state in the future.

Semester Scholars Programs. Across the Alliance, these programs focus primarily on retention and development towards high scholastic achievement in SMET fields. At some campuses variations such as, Jump-Start and Traineeships, are found. Since the OKAMP Scholar is selected on the basis of proven academic abilities, retention efforts address risk factors that relate to satisfaction with the academic experience and choice of major field. National surveys of SMET students show that these kinds of risk factors are often as important as academic survival.

Three standard strategies are used widely to encourage the maintenance of higher coursework performance standards.

- ⇒ Aggressive management of financial incentives. Semester-by-semester grade reviews and adjustment of stipends based on performance (grades).
- ⇒ Intense "tracking" practices which actively involve the student and supplemental long-term course portfolio management.
- ⇒ Tutoring, cooperative work sessions and consultations with course instructors.

Other risk factors, related to the Scholar's sense of well-being, connections with the relevant academic community and intellectual satisfaction with the choice of SMET major are addressed as follows.

- ⇒ Encouraging participation and leadership in a campus organization.
- ⇒ Mentoring by a SMET faculty or staff member.
- ⇒ Hands-on experiences within a SMET department.
- ⇒ Participation in scholarly activities (seminars, symposia, etc) and other events in SMET departments and College.
- ⇒ Mechanisms for peer networking and SMET community building.
  - Program meetings
  - Cadre meetings (small group of related majors)
  - Electronic bulletin boards and or/e-mail groups

- Programming activities: applying for scholarships and off-site internships, time management, goal-setting and attainment, entrepreneurship, SMET field exploration, SMET faculty interviews, research project development and presentation, presentations by scientists and science and mathematics educators.

Upperclassmen who have entered the formal "Mentoring Component", preparation for graduate school is provided through workshops conducted by the Graduate College.

⇒ Affiliate Scholars were supported at six colleges and universities in 1998. Since 1995, students at up to twelve different Affiliate institutions received OKAMP stipends through Cooperative Agreement with the Oklahoma AMP.

- Affiliate Scholars are tracked and mentored by volunteers at the respective institution. These volunteers are usually an academic advisor within the SMET department or a general advisor (a retention specialist at Oklahoma City Community College). At Tulsa University, a private research university, Dr. J.C. Diaz, Computer Science Dept. and Dr. Peggy Hill, Biology Dept served as both liaison and collaborator.

⇒ To retain students in a SMET curriculum, OKAMP encourages intra-institutional or inter-institutional transfer within the SMET matrix. Due to improvements in Articulation agreements and the development of a website on inter-institutional course by the Oklahoma State Regents for Higher Education <<http://www.osrhe.edu/>> equivalents, it is now easier for the OKAMP Scholar and all other students to plan course transfers between institutions within the collaborative. Three students who transferred to OKAMP program within the state were retained in SMET fields.

Research Internship Programs. It is through Research Internships that OKAMP students are most effectively directed toward a committed career in a SMET field and encouraged to seek the necessary graduate training. Research activities not only broaden the educational program but in a very direct way introduces the intern to the work-style and life-style of practicing scientists etc.

⇒ Seven of eight OKAMP institutions are funded to offer summer internships opportunities but because of inter-institutional collaboration, a Scholar at any school can participate.

- Interns were exchanged between Alliance schools

⇒ Several OKAMP students completed or are presently engaged in off-campus internships in 1998. Reviewed below:

- Natural Resource Conservation Service, Jay, OK
- Oak Ridge, Los Alamos and Sandia National Laboratories.
- Johns Hopkins University
- Conoco Corporation of Oklahoma
- The Technical University of Munich
- The University of North Carolina

*Many students are now actively engaged in research activities during Fall and Spring semesters as well as fulltime Summer Research. This is characteristic of our "Mentoring Component". This component would not be possible but for the great sense of obligation and dedicated service of SMET research faculty.*

⇒ The annual statewide OKAMP Research Conference was held at the Noble Research Center. A keynote presentation by 4<sup>th</sup> year interns Brett Cowan, Engineering; Joseph P. Hall, Geology; Joseph L. Jones, Engineering. Over 30 posters were featured.

⇒ **A Resource Guide and Mentor Directory** was prepared by Judy Batson, Program Manager, for use by all Alliance members. Standard Guidelines for internships were continued. The list of **EPSCoR Centers** scientists were again the majority of prospective mentors. Topics covered in the guide: Identifying a research mentor through electronic media, interviewing and preparing a joint proposal, poster preparation. Contact information for state research universities, research centers, national labs and potential mentors (including e-mail addresses and Websites).

**COHERENCE OF PROGRAM** is achieved through:

- ⇒ Joint planning, recruitment and selection for the Alliance Bridge Program
- ⇒ Regular Meetings - Alliance, Co-PI/Directors, Campus Coordinators,
- ⇒ Advisory Committees
- ⇒ Communications - electronic and conventional Program newsletters and brochures
- ⇒ Governing Board - chaired by the OSHRE Chancellor
- ⇒ Unitized data system

The extent to which members of the partner departments in the sciences and education jointly plan, develop and manage the program is reviewed as follows.

- ⇒ The Physics Department at the University of Central Oklahoma has a 2+2 exchange agreement with Langston University where faculty members from UCO present seminars and teach courses at Langston and students. Drs. S.N. Rao, Co-PI, University of Central Oklahoma and Dr. John P. King taught courses in Physics at Langston University. Dr. Shapiro of Langston University taught mathematics courses at UCO and the University of Oklahoma.
- ⇒ Southeastern Oklahoma State University offers peer-tutoring within Math, Physics, Science and Math Education, Biology and Chemistry Departments. Dr. Lester is extremely successful with placing students in graduate programs.
- ⇒ Membership of the OKAMP Advisory Committee at Northeastern State University includes two OKAMP, one faculty, one administrator and five community leaders. The campus coordinator is on the staff of the Center for Tribal Studies. A tutorial center has been established to serve OKAMP and other students. SMET faculty and staff serve as mentors.
- ⇒ The Minority Engineering Program (MEP) at the University of Oklahoma (OU) provides additional support services to OKAMP students and now have adapted these activities to accommodate students in a variety of SMET fields. The Campus Coordinator serves as a liaison for participant tracking and scholastic development.
- ⇒ At East Central University the OKAMP program is coordinated through the Native American Counseling Center. All science and math departments offer summer research mentors. Jump-Start and Traineeships are ECU innovations.
- ⇒ At Langston University, department chairpersons in SMET areas help administer the program, serve in an advisory capacity to the Co-PI as well as serving as mentors, research directors and academic support session instructors.
- ⇒ At the University of Central Oklahoma, the program is administered by an OKAMP Coordinating Committee with representatives from

Biology, Chemistry, Mathematics, Physics. The program is presently organized as the OKAMP SOCIETY for students and assisted by Mr. Barry Lofton, Director of Multicultural Student Services. Recruitment is assisted by High School and College Relations and Financial Aid offices.

⇒ OKAMP at Northwestern Oklahoma State University is housed in the Department of Sciences and Mathematics. Scholars work directly with mentors and mentors advise the OKAMP director on the academic progress of participants.

1. At Oklahoma State University a Campus coordinator, a multidisciplinary staff of liaisons and a multidepartmental Advisory Committee administrate and manage the campus Scholars Program. Off-campus Scholars are assisted and tracked by a local Alliance member or an appointed surrogate.

**Highlights, across the collaborative**

Departmental and institutional involvement in planning, development and management are assured. Important are:

- ⇒ **Assignment of a Chancellor's liaison to OKAMP by the Oklahoma State Regents for Higher Education.**
- ⇒ 11 of 14 key personnel have active roles or appointments in a SMET Department.
- ⇒ Memoranda and electronic bulletins with updates are distributed from the OKAMP center to a diverse mailing list.
- ⇒ Academic Deans and Department Heads assist OKAMP with recruiting new research internship mentors.
- ⇒ Site visits to Partner campuses by center staff.
- ⇒ Annual newsletter to all members and community.
- ⇒ Bridge Program planning and selections are multi-institutional and are a strong cohesive factor.

**III. STUDENT PERFORMANCE.** When considering grade point average as an indicator of student performance in 1998, the **average GPA 3.02 for OKAMP participants for Spring 1998 is higher than that of all undergraduate students (2.8, based on aggregate sample from Partner campus GPAs). This is an improvement from last year's 2.9 OKAMP average GPA.**

In 1998, 88% of Alliance Bridge Program participants finished the program with a GPA at or above 3.00, while 80% and 85% placed in that range in 1997 and 1996, respectively.

**Persistence Rates (Retention or graduation)** were provided by Theresa Smith, OKAMP Evaluator, from the Oklahoma State Regents for Higher Education data system. For underrepresented minority students, the freshman class of 1995 was the first to demonstrate a marked improvement in retention in year 2; the improvement was seen at year 3 as well. A similar improvement was seen with the freshman class of 1996.

**Table 2. Persistence of underrepresented Minority SMET Freshmen**

| Fall semester | Number of Students | Persistence Underrepresented Minority Students |                      |                      |                      |                      | Graduated within |         |
|---------------|--------------------|--|----------------------|----------------------|----------------------|----------------------|------------------|---------|
|               |                    | 2 <sup>nd</sup> year                           | 3 <sup>rd</sup> year | 4 <sup>th</sup> year | 5 <sup>th</sup> year | 6 <sup>th</sup> year | 4 years          | 5 years |
| 1996          | 388                | 83.4%  |                      |                      |                      |                      |                  |         |
| 1995          | 402                | 81.8%  | 73.9%                |                      |                      |                      |                  |         |
| 1994          | 384                | 76.5%  | 69.4%                | 64.1%                |                      |                      | 13.2%            |         |
| 1993          | 420                | 76.2%  | 66.3%                | 58.3%                | 66.8%                |                      | 7.5%             | 21.8%   |
| 1992          | 421                | 80.6%  | 71.4%                | 62.6%                | 57.5%                | 55.6%                | 6.8%             | 24.1%   |

**Table 3. Persistence of white SMET Freshmen**

| Fall semester Year | Number of Students | Persistence White Students |                      |                      |                      |                      | Graduated within |         |
|--------------------|--------------------|----------------------------|----------------------|----------------------|----------------------|----------------------|------------------|---------|
|                    |                    | 2 <sup>nd</sup> year       | 3 <sup>rd</sup> year | 4 <sup>th</sup> year | 5 <sup>th</sup> year | 6 <sup>th</sup> year | 4 years          | 5 years |
| 1996               | 1345               | 84.7%                      |                      |                      |                      |                      |                  |         |
| 1995               | 1307               | 85.1%                      | 76.3%                |                      |                      |                      |                  |         |
| 1994               | 1421               | 81.8%                      | 73.4%                | 70.5%                |                      |                      | 11.5%            |         |
| 1993               | 1461               | 83.5%                      | 76.0%                | 69.7%                | 76.4%                |                      | 12.7%            | 36.9%   |
| 1992               | 1346               | 82.3%                      | 73.6%                | 68.5%                | 69.8%                | 69.6%                | 10.0%            | 34.5%   |

Graduation rates for the comprehensive universities include bachelor's, master's, and first professional degrees.

Graduation rates for the regional universities include bachelor's degrees only.

SMET: Science, Mathematics, Engineering and Technology majors

Source: UDS, cohort2 reports

Oklahoma SMET underrepresented minority students are retained now at a higher level than before the establishment of the Oklahoma AMP. In the near future we will be able to look at AMP students specifically to compare with others.

**IV ACADEMIC PERFORMANCE INDICATORS**

A larger proportion of SMET enrollment was underrepresented minorities in 1997. (1998 enrollment is not available)

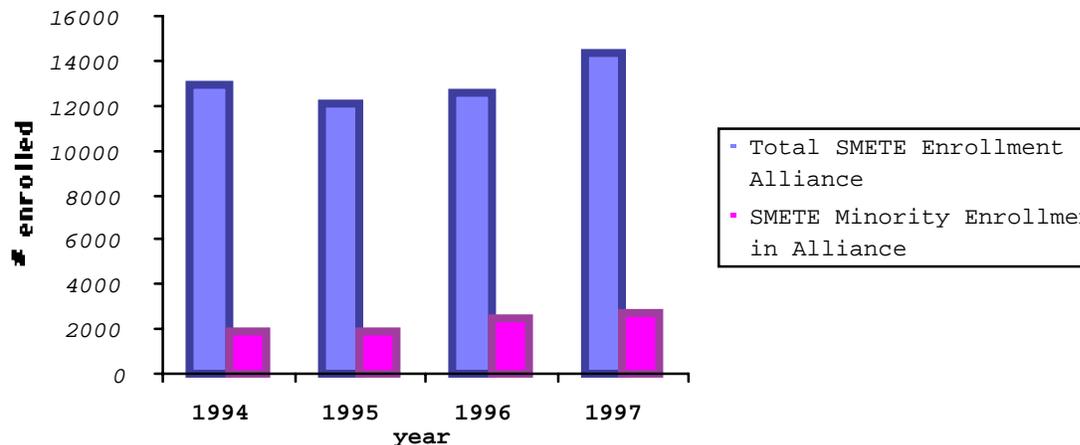
**Table 4. Proportion of Full-time Enrollment in SMET by target group**

| Table       | African-American | Native American | Hispanic   | White        | Total Underrepresented Minority | Total All includes Asian |
|-------------|------------------|-----------------|------------|--------------|---------------------------------|--------------------------|
| 1996        | 930              | 1160            | 359        | 11205        | 2449 (17%)                      | 14396                    |
| <b>1997</b> | <b>1078</b>      | <b>1234</b>     | <b>422</b> | <b>10907</b> | <b>2734 (19%)</b>               | <b>13641</b>             |

Source raw data:UDS, OSRHE

The total enrollment for minorities in SMET increased by 10.4 % in 1997. Total SMET includes counts of all minorities and whites.

**ALLIANCE: SMET ENROLLMENT**



**Figure 5. Growth in SMET Enrollment in Oklahoma**

Although the enrollment growth has slowed, overall, the recovery from the 1995 decline is significant. The overall participation in OKAMP is stable, changing little from the previous year.

**OKAMP participants graduating** since 1995, 8 institutions reporting: OU=6, UCO=14, SEOSU=17, ECU=14, LU=14+, NSU=7+, OSU=28, NWOSU=2+. According to reports from Partner institutions, by the end of 1998, a total of 35 additional Scholars are expected to have completed the requirements for a baccalaureate degree. Presently, long-term tracking efforts for graduates are in the early stages. The institutional research division of the Oklahoma State Regents for Higher Education and Ms. Theresa Smith will assist OKAMP with tracking graduates to graduate programs and possibly the state workforce by accessing the state's unitized data system.

**V. EVIDENCE OF INSTITUTIONALIZATION** (summarized on Table )

- ⇒ The Alliance Summer Bridge Program was funded by a grant from the Oklahoma State Regents for Higher Education (OSRHE).
- ⇒ Dr. Dolores Mize, appointed as the Chancellor's liaison to OKAMP.

| <b>Table 5. Summary Institutionalization</b> | <b>OKAMP Recruitment</b>   | <b>OKAMP offices</b>  | <b>Mentoring activities by SMET faculty</b>                             | <b>Funds from institution /state</b>   |
|--|--|---|---|--|
| <i>East Central University</i>               | <i>x Native American Counseling Office</i>                       | <i>x Physics Dept and Native American Counseling Office</i>               | <i>Semester Scholars Research Scholars Mentors= 13</i>                  | <i>Match-OSRHE Cost share-salary Other support to Scholars</i>   |
| <i>Langston University</i>                   | <i>x SMET Depts; HS Recruitment Office, TRIO</i>                 | <i>x Mathematics Dept</i>   | <i>Semester Scholars Mentors=12</i>                                     | <i>Match-OSRHE Cost share-salary Other support to Scholars</i>   |
| <i>Northeastern State University</i>         | <i>x SMET Depts; Center for Tribal Studies</i>                   | <i>x Chemistry Dept and Center for Tribal Studies</i>                     | <i>Semester Scholars Research activities Scholars=27</i>                | <i>Match-OSRHE Cost share-salary Other support to Scholars</i>   |
| <i>Northwestern OK State University</i>      | <i>x SMET Depts; HS Recruitment Office</i>                       | <i>xMathematics Dept</i>  | <i>Semester Scholars Mentors= 4</i>                                     | <i>Match-OSRHE Cost share-salary Other support to Scholars</i>   |
| <i>Oklahoma State University</i>             | <i>x SMET Depts; Minority Engineering; HS Recruitment Office</i> | <i>xBiochemistry and Molecular Biology Dept; SMET Depts at Affiliates</i> | <i>Bridge Scholars Semester Scholars Research Scholars Mentors= 34+</i> | <i>Cost share-salary Prog Director (.5);Prog Manager ; Data Manager (.5); OSRHE Grant Funds for Bridge Program Other support to Scholars</i> |
| <i>Southeastern Ok State University</i>      | <i>xSMET Depts</i>   | <i>x Biology Dept and Instit Research &amp; Planning</i>                  | <i>Semester Scholars Research Scholars Mentors= 9</i>                   | <i>Match-OSRHE Cost share-salary Other support to Scholars</i>   |
| <i>University of Central Oklahoma</i>        | <i>x SMET Depts, HS Recruitment Office</i>                       | <i>x Physics Dept and Asst. Dean Graduate College</i>                     | <i>Semester Scholars Research Scholars Mentors= 17</i>                  | <i>Match-OSRHE Cost share-salary Other support to Scholars</i>   |
| <i>University of Oklahoma</i>                | <i>x Minority Engineering Prog</i>                               | <i>x Minority Engineering Prog</i>  | <i>Semester Scholars Research Scholars Mentors= 3</i>                   | <i>Cost share-salary Other support to Scholars</i>   |

**VI. COST-SHARING 1998.**

| <b>Table 6.</b>                 | <b>Amount required</b> | <b>Amount documented (as of Oct 1998)</b> |
|---------------------------------|------------------------|---|
| <b>Subcontract Institutions</b> |                        |   |
| <b>Lead Institution</b>         |                        |   |
| <b>Total</b>                    | <b>\$</b>              | <b>\$</b>                                 |

**VII. STUDENT SUPPORT PROGRAMS for Spring, Summer, Fall 1998.** The following figures summarize and compare current participation in Alliance Programs with the previous calendar year participation. [Student support programs were also discussed in a previous PER item, II. Value Added. Please refer to that section for details.]

**TOTAL PARTICIPANTS, 1998 = 299**

**PARTICIPANT DISTRIBUTIONS AND PROFILES:**

Figure.6. Distribution by Race/ethnicity

Figure.7. Distribution by Program Type

Figure.8. Distribution by Academic Major

Appendix Document 1. Accomplishments of Scholars in 1998.

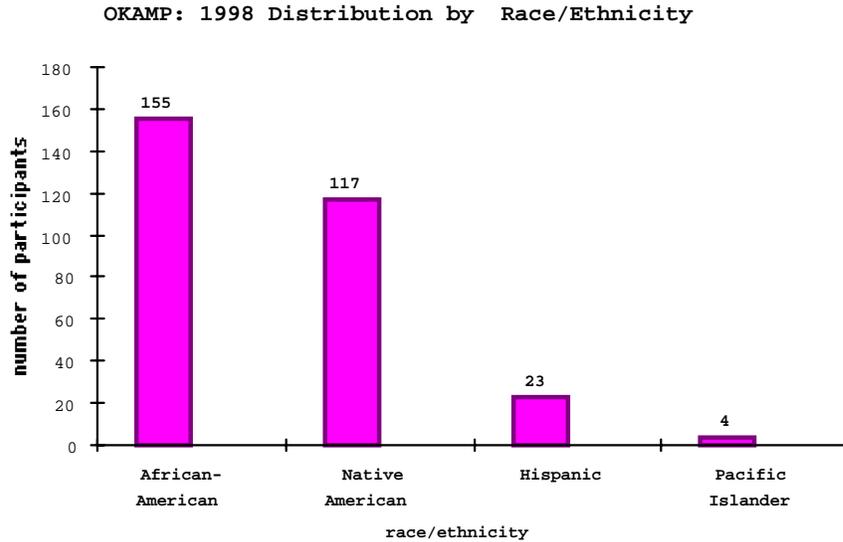


Figure.6. Distribution by Race/ethnicity

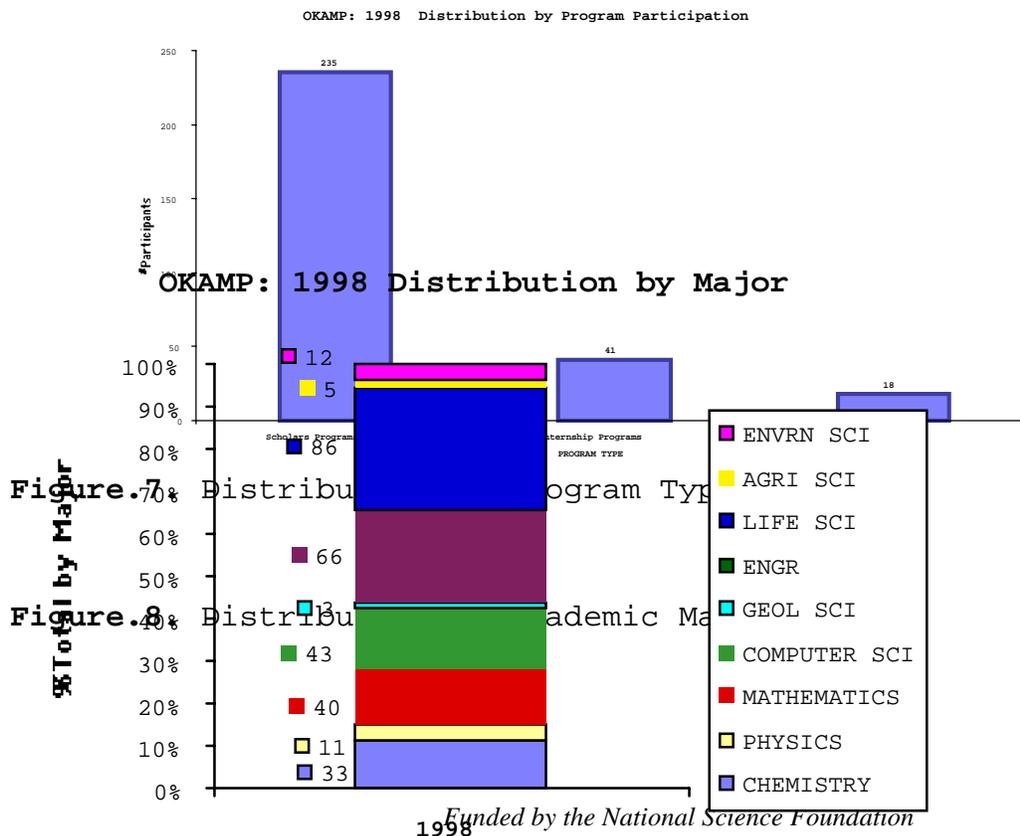


Figure.7. Distribution by Program Type

Figure.8. Distribution by Academic Major

**VIII. High school and community college articulation agreements: admissions, course requirements, transfer credits.**

The Oklahoma State Regents for Higher Education policy "guarantees transferring students successfully completing associate in science or associate in arts degrees that their lower division general education course requirements are satisfied". Other items are:

- ⇒ Basic general education core curriculum
- ⇒ Course Transfer Problem Hotline
- ⇒ System-wide electronic transfer guide at <http://www.osrhe.edu/> on inter-institutional course equivalents (Appendix Document 2)
- ⇒ Continue to increase the number of equivalent courses
  - ◇ OSU/A&M system resolution; equivalency matrix
  - ◇ 2+2 agreements with 2-year institutions
- ⇒ OPBS - a Howard Hughes program targeting life sciences transfer students; collaborative between OSU and 2-yr.institutions
- ⇒ Agreement between OCCC and the Oklahoma Vo-Tech system.

**IX. SUPPLEMENTAL FUNDED INITIATIVE**

**AMP-VI: AMP Virtual Center for Data Analysis and Review**

The AMP Virtual Center for Data Analysis and Review has begun work since its establishment on April 1, 1998. The center's mission is to support AMP decision-making and policy formulation by providing data analyses relating to minority participation in higher education.

During the last six months, the center has worked with the other five AMP-VI partners in accomplishing the following:

1. defining the common goals within the AMP-VI and each individual virtual center's goals and objectives (April 3) .
2. specifying a standard format for web page design among the six AMP-VI centers (May 27).
- 3 surveying individual AMP Alliances to determine the needs from each virtual center (June).
4. communicating to the 27 AMP alliances the goals and objectives of the virtual center (July 16, 1998).
5. exchanging progress reports; setting March 15 as the target date for completing the development of each center's web site and April 26-May 14 as a tentative period for unveiling the AMP-VI websites.

As an AMP-VI member, the center has worked towards its unique set of goals in data analysis:

1. **Establish benchmark data on minority participation in higher education.**

A presentation was made at the Project Directors' Meeting in Polson, Montana on July 16. This presentation has since been developed into a paper for purpose of publication. The title of this paper is "Baccalaureate degree attainment and precollege preparedness of Underrepresented Minorities." Included in the paper is a bibliography of retention literature and national data sources of academic performance indicators (degrees

conferred, enrollment, college enrollment rates, high school graduation rates, etc).

**2. Facilitate the WebAMP data collection process.**

Reviewed the WebAMP data collection designed with QRC staff members Chris Pietras and Kathleen McCarty on April 2 and again on June 18.

Surveyed a sample of five alliances: California State U, Alabama, Texas A&M, Heartland and Mississippi.

Based on the above review and survey responses, a report on the status of WebAMP data collection process with preliminary recommendations was prepared for AMP Program Director, Dr. Hicks.

By the end of this project period (June 30, 1999), a data dictionary and a data manual will be completed.

**3. Maximize the usage of WebAMP data.**

Reviewed past years' data provided by the QRC and studied the quality of comparison over time. Made preparation for reporting 1997-98 data. Will work with the QRC staff members after the end of the data collection deadline of October 31 to review the WebAMP data and compile reports.

**X. SUMMARY IMPACT of the AMP PROJECT.**

The Oklahoma Alliance for Minority Participation in Science, Mathematics, Engineering, Technology and Education (OKAMP-SMET), comprising twenty seven universities and colleges within the state of Oklahoma, has been established to address the critical undersupply of minority students pursuing degrees in SMET fields. The participating institutions include three research universities, Oklahoma State University, the University of Oklahoma and the University of Tulsa; Langston University, Oklahoma's historically African-American university; one large metropolitan and urban university, the University of Central Oklahoma; nine regional universities of the state system; eleven two-year colleges including Bacone College, a private American Indian College and three other private colleges and universities. The 1997 Oklahoma Department of Commerce Census shows Oklahoma to have the highest American Indian population in the United States (8.4% American Indian, 7.6% African American, 2.6% Hispanic and 1.3% Asian/ Pacific Islanders). The Alliance institutions together enroll over 2000 minority students with undergraduate majors in SMET.

Through the three undergraduate support programs the Oklahoma Alliance is accomplishing the primary goal and objective of this program to have a 15% increase annually of the number of underrepresented minorities enrolled and graduating in SMET fields of study thus facilitating an increase in the number of graduate students in these same fields. For SMET undergraduate degrees earned, from the baseline in 1994, the increase in year one, 1995, was 14.9 % . In 1996, year two of the program, the increase was only 4.8% over the previous year. This number seemed low; however, the graduation for non minorities declined by 6.6%. The third year, 1997, showed a remarkable increase of 43.6% (n=458) from 1996. The year four (1998) outcome of 410 degrees resulted from generating well over the projected 374 degrees from the 1994 baseline of 214 degrees earned by underrepresented minority students in Oklahoma. In addition to

generating an increase in degrees earned, OKAMP-SMET programs are influencing the overall academic culture by encouraging more high quality undergraduate research experiences for a broader pool of students. These activities, along with essential mentoring can only strengthen the quality of education programs at all levels. The Oklahoma AMP is helping the state develop new strategies for producing a continuous stream of well-educated and highly proficient SMET graduates.

**APPENDIX INDEX**

**Page 16.**

**Appendix Table 1.** Production of Minority BS SMET Graduates in Okla Alliance

**Appendix Table 2..** SMET Degree Data for the state.(see insert pages)

**Appendix Table 3..** SMET Enrollment for the state.(see insert pages)

**Page 17.**

**Appendix Document 1.** Accomplishments of OKAMP Scholars.

**Page 25**

**Appendix Document 2.** COURSE EQUIVALENCY PROJECT – CEP OKLAHOMA SYSTEM OF HIGHER EDUCATION

**Page 33.**

**Appendix Document 3** Key Personnel

**Page 35.**

**Appendix Document 4** Announcement, Agenda/Minutes for the Presidents Council meeting

**Appendix TABLES**

**Appendix Table 1.** Production of Minority BS SMET Graduates in Okla Alliance

|                  | EXPECTED | ACTUAL       |
|------------------|----------|--------------|
| <b>1993-1994</b> | BASELINE | <b>214</b>   |
| <b>1994-1995</b> | 246      | <b>246</b>   |
| <b>1995-1996</b> | 283      | <b>258</b>   |
| <b>1996-1997</b> | 325      | <b>458</b>   |
| <b>1997-1998</b> | 374      | <b>410</b>   |
| <b>1998-1999</b> | 430      | <b>FINAL</b> |

**Appendix Table 2..** SMET Degree Data for the state(see inserted pages)

**Appendix Table 3..** SMET Enrollment for the state(see inserted pages)

**Appendix Documents. SUPPORTING DOCUMENTS**

**Appendix Document 1. Accomplishments of OKAMP Scholars.**

**SCHOLARS PROFILES**

Abstracts 1998 Research Internship Activities

**Brett A. Cowan, Civil Engineering (Environmental Option), Senior**

Mentor: Dr. Gregory Wilber, Department: Civil Engineering, OSU, Stillwater

Title of Project: Biodegradation of Surfactants

This project builds on earlier work by the principal investigator in conjunction with an on-going project funded by Kimberly-Clark, Inc., through the Oklahoma Alliance for Public Policy Research. In the two months of research three surfactants were used: SN-70, CTAB and T-205. Using varying concentrations of these surfactants in standard BOD bottles, Dissolved Oxygen (D.O.) readings were taken daily. The BOD was then calculated to find the range of biodegradability and possible toxicity for the three surfactants. The results were consistent. SN-70 showed the most promising results, though it appeared to become toxic at around 10mg/L. The other two surfactants seemed to only biodegrade below the concentration of 1mg/L. Further research would need to be done on the SN-70 but it seems to be a possible candidate for the Kimberly-Clark project.

**Thomas R. Jones II, Biotechnology w/ Minor in Food Science, Senior**

Mentor: Dr. Tom Phillips, Entomology and Plant Pathology, OSU/NRC

Title of Project: Evaluating Natural Repellants For Use in Insect-Resistant Food Packages

Many types of food packages are susceptible to invasion by insects; therefore a need to develop packaging that is resistant to this type of invasion is warranted. On account of this need, repellency bioassays were employed to determine which natural compounds and dosages would sufficiently repel the insects *Tribolium castaneum*, Red Flour beetle, and *Oryzaephilus surinameus*, Sawtoothed Grain beetle. Many of the chemicals tested were natural compounds such as cassia, lime, peppermint, and other natural oils. Additionally, individual components of these oils were tested. Results indicate that all of the natural compounds tested are repellent with cassia oil being significantly repellent.

**Joseph L. Jones, Civil and Environmental Engineering, Senior,**  
Mentor: Timothy F. Kennedy, Director, Kaw Nation Environmental  
Department, Kaw City

Title: On the Environmental Impact of the Petroleum Industry on the  
Arkansas River Watershed of the Former Kaw Reservation

**Joseph Hall, Geology, Senior**

Mentor: Dr. Darwin R. Boardman II, Department of Geology, OSU,  
Stillwater. Title: Possible Worldwide Stratotype Boundary for the  
Missourian-Desmoinesian North American Stages in Northeastern Oklahoma  
Detailed study of the fossil fauna characteristics of several  
outcrops of the Kansas City and Pleasanton Groups in Northeastern  
Oklahoma has lead to the repositioning of the Missourian-Desmoinesian  
North American stage boundary.

**Mary Rachel Bell, Nutritional Science, Sophomore**

Mentor: Dr. B. Stoecker, College and/or Dept Nutritional  
Sciences/Human  
Environmental Sciences. OSU, Stillwater

Title: Bone Loss in Rats due to tail suspension or prune diet

The intention of these studies is to see the bone loss in rats  
due to tail suspension, which would be the equivalent of the loss a  
person in outer space or a bed rest patient would suffer. The diet is  
being fed to them to see what would help to slow down this process of  
deterioration. Several different methods were used to test the  
different parts of the specimen, which included: the use of a FARA  
analyzer, atomic absorption analyzer, a gamma counter, and a  
photospectrometer.

The rats were fed the diet, then urine and feces collected and  
analyzed. The rats were sacrificed and the calcium in the bone was  
assayed. In the prune study it has been found so far that a 5% prune  
diet helpsto reduce the risk of osteoporosis.

**Acacia M. Bender, Environmental Science, Junior**

Mentor: Douglas W. Hamilton, Ph.D., P.E., Biosystems and Agricultural  
Engineering, OSU, Stillwater

Title: Identifying Biological Communities in A Facultative Lagoon

Facultative lagoons use communities of anaerobic and aerobic  
bacteria to reduce high strength organic materials. Anaerobic  
processes use biological fermentation to reduce complex organic  
material into simpler compounds. However, fermentation can also create  
unpleasant odors. Aerobic processes oxidize fermentation products to  
more stable, less odorous compounds. A facultative system uses both  
anaerobic and aerobic processes to reduce odors and digest solid by-  
products. These biological processes take place within communities.  
Water samples taken from the OSU Swine Research Center lagoon were  
analyzed to determine the microbial communities present in a healthy  
facultative lagoon. Nucleic acids were extracted from the microbes  
taken from varying depths in the lagoon. These depths were selected  
by temperature variations. The 16s ribosomal genes were amplified  
using the polymerase chain reaction. Restriction enzymes were then  
added to the amplification products to yield a fingerprint of the  
community. This was used to determine relationships between chemical  
properties of the lagoon and the makeup of the microbial communities.

**Lorna Carter, Biochemistry, Jr**

Mentor: Dr. Margaret Essenberg, Dept. of Biochemistry, OSU

Analysis of Transgenic Cotton Plants for Defense Compounds

The purpose of this project is to investigate if the resistant cotton

plant will become susceptible to the disease, bacterial blight, if the defense compound, phytoalexins, are prevented from being made by the plant. The research groups of Drs. Marlee Pierce and Margaret Essenberg have genetically engineered plants with three kinds of DNA constructs. These DNA constructs are the sense-construct, the anti-sense construct, and empty vector control. During my internship in the Dept. of Biochemistry, my project is to screen some of the transgenic cotton plants to identify the ones in which the transgenes have a strong effect. First, I propagated the transgenic plants by making cuttings under sterile conditions. Second, these root cuttings were transplanted to soil and grown in growth chambers. Third, the young leaves were harvested to be analyzed for the defense compound, gossypol. Then, I tested the plants with the sense and anti-sense constructs to find which had high and low levels of gossypol relative to transgenic cotton plants with the empty vector control. The sense-construct plants have not yet shown gossypol levels significantly higher than those of the empty vector control and anti-sense plants. The results have shown suppression of gossypol levels in some of the sense-construct plants as well as anti-sense construct plants. Lowest gossypol levels observed were 8% and 14% of control values, respectively. Other sense-construct plants had gossypol levels as high as 175% of control levels. Surprisingly, some of the plants with the anti-sense construct had levels as high as 243% of gossypol.

**John Castro, Electrical Engineering, Sophomore**

Mentor: Dr. Jerry Krasinski, CEAT, Center for Laser Research, OSU  
Title: TBA

To generate shorter laser pulses used for optical communication. This was achieved by increasing the power of the laser.

**Samuel J. Cluck, Mechanical Engineering, Sr**

Mentor: Dr. Dwight L. Myers, Dept. of Chemistry, ECU  
Title: Vapor Pressure Measurements of Oxygen in Equilibrium with  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$

Samples of yttrium barium copper oxide were synthesized using the solid state method[1]. The oxygen content of the samples were determined using the method of Appelmann *et al.*[2]. Vapor pressures of oxygen in equilibrium with the superconductor were determined utilizing the transpiration method of vapor pressure measurement[3]. The oxygen content of the samples after the vaporization experiments were inferred from the initial oxygen content and the mass loss, assuming only oxygen was vaporized from the sample. This research is part of an ongoing effort to compile a larger database of vapor pressures for several superconductor compositions[4]. Results are compared to the statistical thermodynamical model of Thorn *et al.* [5]. Results are compared to Thorn's model by means of computer programs developed at East Central University.

**Mark A. Clytus, Chemical Engineering, Junior**

Mentor: Dr. Randy Lewis and Dr. A. Johannes, Dept. of Chemical Engineering, OSU, Stillwater.

Title: Biomass Conversion to Ethanol

Biomass conversion to ethanol is a viable alternative to using fossil fuels as an energy source. Utilization of fossil fuels can result in significant air pollution. Ethanol is a clean burning fuel and biochemical synthesis of ethanol has a promising future. Previous

research utilizing biomass conversion for ethanol production has incorporated the use of bacteria to break down the biomass into fermentable sugars which leads to the production of ethanol. Some research has investigated the gasification of biomass to syngas, followed by the conversion of syngas via bacteria to ethanol.

This research continues the gasification work by incorporating a pilot scale gasifier with a bioreactor. The effects of the products produced by the gasifier on the functionality of the bioreactor will be studied. Initially, a four liter bioreactor is being designed and built. This work outlines the design of the bioreactor system with the overall objective of producing ethanol.

**Christina Goodrum, Math (education conc), Sophomore**

Mentor: Dr. Brenda Masters, Statistics, OSU

Title: TBA

The specific intention if this project is to use statistical methods (sampling) to gather valid information for using to give minority high school students information about Oklahoma Universities, and different scholarship and grant information.

The expected long-term outcome is that distribution of the findings will encourage more minorities to attend a university.

**Steven Hutchens, Microbiology, Jr**

Mentor: Dr. Robert Miller, Department of Microbiology and Molecular Genetics OSU, Stillwater

Title: Visualizing gene expression utilizing a bioluminescent biosensor The need to develop a whole-cell biosensor that accurately reports and measures the health of microorganisms in their environment laid the foundation for this project. Specifically, DNA mutations as a result of physical means, UV light, or chemical means, harmful pollutants, was the target of interest. Through a gene fusion constructed on a plasmid, i.e. extrachromosomal DNA, we were able to evaluate our organism *Pseudomonas aeruginosa* in its expression of the recA gene which encodes for the RecA protein that repairs damaged DNA.

**Rashid Kiwanuka, Mathematics, Sr**

Mentor: Dr. Richard A. Redner, Math and Computer Science Dept, TU

Title: Linear Combinations of B-splines

We examine the algebraic structure of linear combinations of B-spline basis functions, explore properties and uncover formulas. We clearly articulated methods for simplifying complicated linear combinations into more applicable forms. Theorems that we prove will aid researchers in their work using B-splines. These facts, although basic, are fundamentals to more complex theoretical studies of B-splines.

**Shana Mashburn, Geology, Senior**

Mentor: Dr. Puckette, Department of Geology, OSU, Stillwater

Title of Project: Petrographic Analysis of the Desmoinesian Bluejacket Sandstone, Mayes County, Oklahoma

Abstract: TBA

**Patrick McLean, Electrical and Computer Engineering, Sophomore**

Mentor: Dr. Jerry Krasinski, CEAT, Center for Laser Research, OSU

Title: Autocorrelation of a Femtosecond Laser

To determine the most effective way to increase laser speed.

**Aaron McCool, Mathematics, Sophomore**

Mentor: Dr. Christine A. Johnson, Bureau for Social Research, College of Human Environmental Sciences, OSU

Title: Perceptions about Professional Development in a Sample of Dieticians

The American Dietetic Association (ADA) has the Commission for Dietetic Registration (CDR) as the agency that credentials Registered Dieticians (RD) and Dietetic Technicians, Registered (DTR). In the year 2001, the CDR will implement a new credential procedure, Professional Development Portfolio (Portfolio). The purpose of this study was to assess dieticians knowledge of these new procedures and their attitudes toward professional development. A battery of research items were developed and data were collected by utilizing a self-administered mailed questionnaire.

**Lekisha Muldrow, Biology, Sophomore**

Mentor: Dr. Kenton Miller, Biology Dept, TU

Title: Determining the Sialic Acid Content of Specific B Cell Membrane Glycoproteins

Abstract: TBA

**Johnetta Nesbitt, Chemical Engineering, Sophomore**

Mentor: Dr. Etop Esen

Conoco Inc. Ponca City, OK

Title: Cracking

The purpose of my project is to find out which gas oils and catalysts work best for the Conoco refinery Fluid Catalytic Cracking Units (FCCU), so that the refineries are able to maximize gasoline production and minimize slurry (lowest value product) yield.

Obtain gas oil and fresh catalyst samples from the refinery the study is being performed on. Send a sample of gas oil and catalyst for testing. Steam catalyst to deactivate it, so it has same activity as catalyst in refinery's FCCU. Run a surface area test on catalyst to make sure the deactivation process was done appropriately. Load the steamed catalyst and the gas oil into the Fluid Bed Cracking Unit (FBCU).

Allow the cracking reaction to take place in the machine. After all six runs have been completed, send liquid products to Simulated distillation machine and then Grace calculated octane number machine and send gas products to gas chromatograph for analysis. Results of analysis are sent to mass balance program for tabulation of yields. The most important yields are gasoline, activity, coke and slurry.

Two of the three studies I worked on are complete. The first study was to find the best catalyst for the Ponca City No. 5 FCCU. The best catalyst was the Maxol PC because it had much better activity and coke selectivity, less slurry yield and only a slight decrease in gasoline yield. The second study was to compare a current catalyst with a previous catalyst and to see the effects of an additive. The current catalyst was working better because it had much higher activity and coke selectivity and only about a half percent gasoline loss. The additive did not show a significant benefit.

**Tonishia Owens, Biochemistry, Junior**

Mentor: Dr. William Potter, Department of Chemistry, University of Tulsa

Title: Measurement Technique for the Collection and Analysis of the

## Nitrate Aerosols And Nitric Acid Vapors In the Air

The intent of this project was to find a simple and manual technique that provided the collection, measurement, and analysis of nitrate/nitrogen oxides in the air/atmosphere. Known versions of various filter pack methods were compiled and used to expound the overall technique. To date the measurements produced by this method are accurate indicators of ozone formation (O<sub>3</sub>) in the tropospheric level of our atmosphere.

### **Daniel Wilson, Computer Science, Jr**

Mentor: Dr. Sandip Sen, College of Science & Engineering,  
Computer Science Dept, TU

Title: Developing an Automated Distributed Meeting Scheduler

To develop an automated process time scheduling and attending meetings. The theoretical methods used was a distributed approach, by which each person using the application is given his own intelligent agent. These agents communicate with one another over a network to decide upon meeting times. Each agent makes decisions based upon information derived from other agents and from a user-defined set of preferences as to meeting times and invitee priorities. Since the research phase is complete and we are now implementing the program in Java. Naturally, our theoretical preferences are limited by tangible realities of programming and these conflicts are what we are currently dealing with.

**Adrian Casias**, Engineering, Junior, Drs. W. Pasco and E. Lopez,  
Sandia Laboratories, NM 8

"Investigating a New Etching and Polishing Process for the Large Flange and Associated Parts in the Production of the MC4277 Neutron Tubes"

The Large Flange (Accelerator) of the MC4277 Neutron Tube lies in a high-energy electric field during tube operations. Due to recent poor tube operations, the etching and polishing process is being reevaluated due to breakdowns around the Large Flange. The breakdowns are believed to be caused by a non-uniform surface meaning burrs, needles, or rough spots that act as micro lightning rods in this high-energy electric field. Particles from the polishing paste on the surface and embedded in the flange and the roughness of the flange itself after the polishing process are probably the sources of these electric field breakdowns. To correct these problems, several processes are being evaluated in parallel. Two of these processes being explored use a new electropolishing process and a new rigid sanding polishing process using a lathe with mechanical sanding and polishing methods. These two new processes should minimize operation time, improve quality, lessen the labor intensity, and be more consistent processes so that less breakdown occurs around the Large Flange.

**LaTasha Vick**, Biochemistry Senior, Dr. Edward Collins, Dept  
Micro/Immuno, University of North Carolina Design and development of  
immune therapeutics.

- Conducted research on protein 39, which is involved in immune defense
- Mutated plasmid DNA by annealing 4 mutagenic primers
- Analyzed the plasmid/protein response to the mutation
- Suggested that 1 of the 4 mutagenic primers resulted in a lethal/functional gene

**Other Interns and Scholars who have done research or completed degree requirements are:**

**Kristi Carson**, Senior biology major, ECU, "Presence of dsRNA Variations in *Monosporascus cannonballus*"

**Ruby McCaslin**, Junior math major, ECU, "An Historical and Cultural View of the Pythagorean Theorem and Its Proof"

**Larry Watts**, Sophomore pre-engineering major, ECU, "Comanche Language SpellingChecker"

**Gloria Henson**, Junior biology major, ECU, "Purification of Chitobase from Cantaloupe"

**Samuel Cluck**, junior engineering major, OSU, "A Study of the Defect Structure of Copper Oxide (123) Superconductors"

**Paul DeLaCerde**, Engineering, Jr, Award-winning design, the "Pooch Pass", an engineered housepet entry/exit device. Patent application procedures under investigation. Paul received the Hispanic Engineer National Achievement Award, 1998.

**Michelle Asare**, Dr. Brenda Masters, Statistics, Statistical evaluation of economic reasons that affect students entering college

**Sandra McNeil**, Engineering Senior, Dr. Dorgan, Technical University of Munich, IACE, Arcisstrasse 27, 80333 Munich, GermanyThe use of co-contraction and N-lets for the development of new control strategies for Neuroprosthetic devices.

**Kervin Colbert**, Engineering Sophomore, Dr. John Guthrie, Dept Physics, UCO, Edmond, OK 73013Using LabView to design virtual instruments for use in optics and electronics.

**Lisa Fields**, Environmental Science, Senior, Dr. M. D. Smolen, BioEngr, Bioassays of a creek or waterway running through Pawnee tribal land.

**Faron Kirby**, Biology Senior, Merrie Reeder, NRCS, 100 USDA Ste 203, Stwr, OK 74074 To determine the effects on Lake Eucha of phosphorus and nitrogen waste excreted by poultry

**Quentin Smith**, Engineering Sophomore, Dr. Rick Allison, Elec Tech, OSU-Tech, 1801 E 4th St, Okmulgee OK 74447 Determining the impact of selected automated manufacturing processes used in Oklahoma

Notable SEOSU students:

|                             |      |         |                                     |
|-----------------------------|------|---------|-------------------------------------|
| <b>Inissha (Jones) Hill</b> | grad | sp 1998 | grad school OSU                     |
| <b>Terry Canado</b>         | grad | sp 1998 | Officers cand. sch                  |
| <b>Jenny Wilson</b>         | grad | fa 1998 | Plans to go to grad school          |
| <b>Kim Haley</b>            | grad | fa 1998 | Presently plans to enter work force |
| <b>Amy Clampet</b>          | grad | fa 1998 | Become teacher.                     |
| <b>Tim Noahubi</b>          | grad | fa 1998 | Not sure which graduate program.    |

**Appendix Document 2. COURSE EQUIVALENCY PROJECT -- CEP  
OKLAHOMA SYSTEM OF HIGHER EDUCATION  
1997-1998 Academic Year**

**WHAT IS THE CEP?**

The Course Equivalency Project (CEP) is a postsecondary education resource service that provides course equivalency information to facilitate student transfer within the Oklahoma System of Higher Education. Its data base contains faculty-generated course equivalency information for hundreds of courses offered at public institutions in Oklahoma. The courses are organized by discipline: biology, history, etc. Within each discipline, several equivalency groups appear, each containing a collection of courses from sponsoring institutions. A generic course title and State Regents' equivalency number (a two-letter prefix and three-digit number) located at the top of columns identify each equivalency group. Credit for a course within a group can be transferred to any system institution which sponsors a course in that group.

**WHAT IS THE DEFINITION OF EQUIVALENCY?**

Course equivalency is defined as follows: Course "A" is equivalent to course "B" if and only if "A" satisfies all program requirements that course "B" satisfies--serving exactly the same purpose with respect to content delivery, general education, or program degree requirements. Lower-division course work cannot substitute for upper-division credit-hour requirements. However, the content is transferable. For example, if a student completes Smart Course 2000 at two-year college A, it will transfer in content to four-year college B for its Smart Course 3000. The student will not need to repeat the content or learning competencies acquired in Smart Course 2000. But, the student must still complete the full amount of 3000- and 4000-level semester hours that college B requires for a baccalaureate degree.

**HOW DOES THE CEP BENEFIT STUDENTS?**

Students who anticipate transferring to other institutions can access the CEP to learn which institutions will automatically credit their course work as being equivalent. From the CEP, students can also reach available home

pages of system institutions to find more detailed information about course descriptions, prerequisites, or degree requirements.

#### HOW DOES THE CEP BENEFIT FACULTY?

When designing new curriculum, faculty can use the CEP as a course equivalency reference and obtain course content descriptions. Faculty Curriculum Transfer Committees representing all system institutions establish the common course content descriptions for their disciplines.

#### HOW DOES THE CEP BENEFIT ACADEMIC ADVISORS?

With the CEP, academic advisors can quickly access accurate, up-to-date course equivalency information, helping students make better informed decisions about their education planning. Advisors can also impact the development of the CEP. Oklahoma Academic Advisors Association (OACADA) representatives attend annual system-wide faculty transfer meetings, and advisors can use the evaluation component of the CEP to provide important feedback information for improving its service.

#### WHY SHOULD STUDENTS SEEK ACADEMIC ADVISING?

Incomplete educational planning can lengthen the time it takes students to complete a degree and adds unnecessary costs. Visit with your academic advisor to develop a comprehensive and accurate educational plan. Advisors can identify those courses listed in the CEP that require prerequisites and can help outline institutions' program degree requirements. Advisors can also inform students about those courses that individual institutions consider equivalent in separate articulation agreements but are not included in the CEP. Finally, academic advisors inform students of support services and other valuable campus information that can give students a competitive edge.

#### DISCLAIMERS.

1. Any individual may download and/or print the information contained herein for purposes of course planning, advisement or other educational use. Because it is not possible to ensure the accuracy of any such copy, the State Regents are not responsible for the contents of downloaded information or any information derived therefrom.
2. This information does not constitute a contractual agreement that institutions will offer all the courses described.
3. CEP information is valid only for the academic year listed in the heading.

#### HOW TO USE THE CEP.

This simple menu-oriented system will be familiar to users of Internet home pages. Move the indicator arrow to the desired menu item and click on it.

Move up and down the information by clicking on the scrolling arrows at the screen's right edge. To view multiple pages of equivalency information, click on "next page" to move forward and click the Web browser's "back" button to reverse direction. When using an Internet browser other than Netscape Navigator version 3.0 or Microsoft Internet Explorer version 3.0, some formatting distortions may be seen in the CEP. Best viewing is possible with a small to medium font size.

When you select an academic discipline, i.e., mathematics, all established course equivalencies for that discipline will appear along with a list of system institutions that offer equivalent courses in that discipline. The equivalency information is in a matrix format with institutions listed vertically to the left and equivalency group headings and numbers listed horizontally along the top. All courses appearing in a column are considered equivalent at "only" the course-offering institutions.

To learn the course content descriptions for equivalency groups in computer science, music, or theatre, move the indicator arrow to the cell holding the generic course name and State Regents' number and click with the mouse. In upcoming years, faculty will expand this feature to other disciplines.

For more detailed information about a particular course (course content, credit hours awarded, relationship to degree requirements, and specified prerequisites) select an institution's home page by selecting Colleges and Universities from the menu. If available, search the institution's home page for its course catalog or course offerings.

#### HOW TO ACCESS THE CEP EQUIVALENCY INFORMATION FOR PRIOR YEARS.

Every year, faculty representing all system institutions meet to update and add courses to the course equivalency matrices. There is a different CEP version for each academic year beginning with 1996-1997. Institutions keep a record of previous CEPs so that students can transfer to other system institutions without losing the established equivalencies for completed course work. Please refer to the menu for access to equivalency information for prior years.

#### HOW TO INTERPRET COURSE NUMBERS.

Course numbers of individual institutions show considerable variation. Generally though, all 1000-numbered courses are freshman level, 2000-numbered courses are sophomore level, 3000-numbered courses are junior level, and 4000-numbered courses are senior level. Upper-division course work is numbered 3000 or above, and lower-division work is numbered 2000 or below.

#### CAMPUS ABBREVIATIONS.

CASC

|           |  |
|-----------|--|
| CSC       | Carl Albert State College                                |
| CU        | Connors State College                                    |
| ECU       | Cameron University                                       |
| EOSC      | East Central University                                  |
| LU        | Eastern Oklahoma State College                           |
| MSC       | Langston University                                      |
| NEOAMC    | Murray State College                                     |
| NOC       | Northeastern Oklahoma A&M College                        |
| NSU       | Northern Oklahoma College                                |
| NWOSU     | Northeastern State University                            |
| OCCC      | Northwestern Oklahoma State University                   |
| OPSU      | Oklahoma City Community College                          |
| OSU       | Oklahoma Panhandle State University                      |
| OSUTB-OKC | Oklahoma State University                                |
| OSUTB-OKM | Oklahoma State University Technical Branch-Oklahoma City |
| OU        | Oklahoma State University Technical Branch-Okmulgee      |
| RCC       | University of Oklahoma                                   |
| Rogers    | Redlands Community College                               |
| Rose      | Rogers University  |
| SEOSU     | Rose State College                                       |
| SSC       | Southeastern Oklahoma State University                   |
| SWOSU     | Seminole State College                                   |
| TCC       | Southwestern Oklahoma State University                   |
| UCO       | Tulsa Community College                                  |
| USAO      | University of Central Oklahoma                           |

## EVALUATION COMPONENT.

For purposes of improving the CEP, please address your suggestions or comments on the project to [crussell@osrhe.edu].

---



The Oklahoma State Regents for Higher Education offer numerous education and career information and preparation programs for eighth through 12th grade students. Many of the programs and materials are listed below, and all printed materials are free. For more information or to obtain copies of the materials, call the Student Information Hotline at 1-800-858-1840 or e-mail the appropriate contact person below.

**Advanced Placement Courses** - Allow students to take college-level course work in high school and receive credit at Oklahoma colleges and universities. For more information, e-mail kbender@osrhe.edu.

**Concurrent Enrollment** - Allows outstanding junior and senior high school students to take credit-earning college courses. For more information, e-mail kbender@osrhe.edu.

**OK-EPAS** - Tests students in eighth grade and 10th grade to assess students' progress in core academic courses and provides feedback to schools, students and parents. Participation in OK-EPAS is voluntary, and school districts must contact the State Regents' office to participate in the program. OK-EPAS is provided free to students. For more information, see EPAS.

**Oklahoma FOCUS** - Helps families with children in grades seven and nine determine how much to save for their children's college education. Also provides career planning information as well as college preparation information, such as admission requirements and core course requirements. Participation in FOCUS is limited to school districts that participate in the OK-EPAS (Oklahoma Educational Planning and Assessment System) program. For more information, e-mail apena@osrhe.edu.

**Oklahoma Higher Learning Access Program (OHLAP)** - Awards scholarships to students with financial need who have demonstrated a commitment to academic success in high school. Students who plan to participate in this scholarship program must enroll in the

program in the ninth or 10th grade. For more information, e-mail [calexander@osrhe.edu](mailto:calexander@osrhe.edu).

Teacher Cadet High School Program - Stimulates high school students' interest in the teaching profession by enabling them to participate in hands-on teaching activities through a yearlong course conducted at their school sites. The program targets high school students and is taught by a master teacher selected by the local school district. It is offered by the Oklahoma Minority Teacher Recruitment Center (OMTRC), a program of the Oklahoma State Regents for Higher Education. For more information, e-mail [apena@osrhe.edu](mailto:apena@osrhe.edu).

Pro Team Middle School Program - Focuses on middle school and junior high school students and encourages them to set goals, such as going to college and pursuing teaching careers. It is offered by the Oklahoma Minority Teacher Recruitment Center (OMTRC), a program of the Oklahoma State Regents for Higher Education. For more information, e-mail [apena@osrhe.edu](mailto:apena@osrhe.edu).

Teacher Job Connection - Operates a data network which matches school district job vacancies with qualified teacher applicants. It is offered by the Oklahoma Minority Teacher Recruitment Center (OMTRC), a program of the Oklahoma State Regents for Higher Education. For more information, e-mail [apena@osrhe.edu](mailto:apena@osrhe.edu).

OneNet - Is Oklahoma's telecommunications and information network for Oklahoma education and government. For more information, e-mail [bshafer@onenet.net](mailto:bshafer@onenet.net).

Student Information Services Hotline (1-800-858-1840) - Provides information on financial aid, admission requirements, placement scores and more.

Summer Academies - Provides eighth through 12th graders with approximately 32 math and science summer academies at Oklahoma colleges and universities. Students spend from one to six weeks at the academies. Provided free to students, academies do not duplicate instruction offered in students' regular course work. For more information, e-mail [sholmes@osrhe.edu](mailto:sholmes@osrhe.edu).

## Materials

Grant and Scholarship Programs Booklet - Lists grant and scholarship programs administered by the State Regents. For more information, e-mail [sholmes@osrhe.edu](mailto:sholmes@osrhe.edu).

A Guide to Oklahoma Colleges and Universities - Provides a short profile on each college and university in Oklahoma and includes information on preparing for college, college costs and financial aid. For more information, see your counselor.

Oklahoma Higher Learning Access Program (OHLAP) Brochure - Explains in an attractive, easy-to-understand format the requirements and benefits of OHLAP, which awards scholarships to students with financial need who have demonstrated a commitment to academic success in high school. Contains two sections, one for students and one for parents. Posters, counselor handbooks and agreement/application packets are also available. Materials are provided to counselors each fall for distribution to ninth and 10th grade students. For more information, e-mail [calexander@osrhe.edu](mailto:calexander@osrhe.edu).

Oklahoma Minority Teacher Recruitment Center (OMTRC) Brochure - Provides an

overview of OMTRC programs and services. Fact sheets that explain the Pro Team Middle School Program, Teacher Cadet High School Program, College Partnership Program and the Teacher Job Connection are also available. For more information, e-mail [apena@osrhe.edu](mailto:apena@osrhe.edu).

Preparing for College Brochure - Outlines the required courses students must take in high school to be admitted to an Oklahoma state college or university, admission standards, placement score information and financial aid information. Brochures are provided to counselors each fall for distribution to eighth through 12th grade students. For more information, e-mail [bmartin@osrhe.edu](mailto:bmartin@osrhe.edu).

Student Competencies for College Success - Lists course-by-course, the basic skills and knowledge high school students should acquire to be prepared for college-level coursework. For more information, e-mail [kbender@osrhe.edu](mailto:kbender@osrhe.edu).

Summer Academies Brochure - Describes State Regents' Summer Academies Programs and includes contact information for each academy. Posters that promote Summer Academies and provide contact information are also available. Materials are provided to math and science teachers in late winter for distribution to eighth through 12th grade students. For more information, e-mail [sholmes@osrhe.edu](mailto:sholmes@osrhe.edu).

Oklahoma State Regents for Higher Education  
500 Education Building, State Capitol Complex  
Oklahoma City, OK 73105

Phone:

Fax:

405.524.9100

405.524.9230

Questions and Comments: [lcallahan@osrhe.edu](mailto:lcallahan@osrhe.edu)  
Last Modified: Wednesday, 17-Sep-97 18:04:40  
Graphic Design by: The Rock Island Group  
URL: <http://www.okhighered.org>

Copyright © 1997

Disclaimer

## **The Courses to Take in High School**

### Public Colleges and Universities

Below are the courses you must take if you want to go to an Oklahoma state college or university. If you enter the job market after high school, these courses will also help you prepare for on-the-job success.

English

4 units

|             |  |
|-------------|--|
|             | (grammar, composition and literature)  |
| Math        | 3 units<br>(Algebra I, Algebra II, geometry, trigonometry, math analysis and calculus) <sup>1</sup>  |
| Laboratory  | 2 units<br>(biology, chemistry, physics or any lab science certified by Science school district; general science courses don't qualify) <sup>1</sup> |
| History     | 2 units<br>(including 1 unit of American History)  |
| Citizenship | 1 unit<br>(economics, geography, government and non-Western Skills culture) <sup>2</sup>   |
| Other       | 3 units<br>(from any of the 11 units listed above, citizenship skills units, computer science units or foreign language units)                       |
| Total       | 15 units   |

1 Some applied math and applied science classes may count.

2 World history will count toward non-Western culture

Note: You can enter some two-year degree/certificate programs without taking these courses. Requirements may change, and they may be different for private colleges and universities, so check with your counselor for details.

Suggestions for Success: Colleges and universities also recommend, but do not require, that you take courses in speech and the fine arts, such as music, art and drama.

### Private Colleges and Universities

Requirements for private institutions may be different, so check with the institution you want to attend for specific information.

For more information on Oklahoma public college and university admission standards, e-mail [kbender@osrhe.edu](mailto:kbender@osrhe.edu), call the Student Information Hotline at 1.800.858.1840 or call 405.524.9170.

## Appendix Document 3. KEY PERSONNEL

### OKAMP-SMET KEY PERSONNEL AND PARTNERS

#### Project Director and Staff:

#### Oklahoma State University

**PD/PI** Earl D. Mitchell, Jr., Ph.D.

Associate Vice President for Multicultural  
Affairs

Professor of Biochemistry and Molecular  
Biology

408 Whitehurst

Stillwater, Oklahoma 74078

(405)744-9154; FAX 744-5576

email [ldsilva@okway.okstate.edu](mailto:ldsilva@okway.okstate.edu)

**Data Manager:** Mr. Yousif Sherif, (405)744-  
8780

**Program Manager:** Dr. Judy M. Batson; Dept.  
Biochemistry and Molecular Biology; 246

Noble Research Center, Stillwater, Oklahoma,

74078-3035; (405)744-7820; FAX 744-7799

e-mail [Judy.Batson@okway.okstate.edu](mailto:Judy.Batson@okway.okstate.edu)

**Campus Coordinator:** Ms. Valerie

Shangreaux; 246 Noble Research Center;

Stillwater, Oklahoma, 74078; (405)744-6710

e-mail [shane@okway.okstate.edu](mailto:shane@okway.okstate.edu)

#### OKAMP-SMET PARTNERS

#### Co-PI's and Coordinators

#### University of Oklahoma

**Co-PI** Mr. Douglas Wayne Steen

Director of the Minority Engineering Program

Norman, Oklahoma 73019

(405)325-4161; FAX (405) 325-7508

email [steen@mailhost.ecn.ou.edu](mailto:steen@mailhost.ecn.ou.edu)

**Campus Coordinator:** Mr. Paul Rochas c/o

Ms. Sydney Jones; email [sljones@ou.edu](mailto:sljones@ou.edu)

Ms. Theresa Smith, Evaluator

Center for Institutional Data Exchange and  
Analysis

UNIVERSITY OF OKLAHOMA

1700 Asp Avenue, Rm 131

Norman, OK 73072-6400

Telephone: 405-325-2158

Fax: 405-325-7698

[tsmith@ou.edu](mailto:tsmith@ou.edu)

#### Southeastern Oklahoma State University

**Co-PI** Dr. Jack L. Robinson

Director of Institutional Research and Planning

**Campus Coordinator:** Dr. James Lester

Southeastern Oklahoma State University

Department of Biology

Durant, Oklahoma 74701

(580)924-0121 X2236; FAX(580)920-7472

email [jlester@sosu.edu](mailto:jlester@sosu.edu);

#### Northeastern State University

**Co-PI** Dr. Myron Cherry

Professor of Chemistry

Tahlequah, Oklahoma 74464-7099

(918)456-5511 x3833; FAX (918)458-

2193;email [cherry@cherokee.nsuok.edu](mailto:cherry@cherokee.nsuok.edu)

**Campus Coordinator:** Ms. Carol Rhoads

email [rhoads@cherokee.nsuok.edu](mailto:rhoads@cherokee.nsuok.edu)

#### East Central University

**Co-PI** Dr. Carl Rutledge

Professor of Physics

Ada, Oklahoma 74820-6899

(580)332-8000 X392; FAX (580)332-1623;

email [crutledg@mailclerk.ecok.edu](mailto:crutledg@mailclerk.ecok.edu)

**Campus Coordinator:** Ms. Kathy Niblett

email [kniblett@mailclerk.ecok.edu](mailto:kniblett@mailclerk.ecok.edu)

#### Langston University

**Co-PI** Dr. Phillip Schapiro

Professor of Mathematics

Langston, Oklahoma 73050-0907

(405)466-3331; FAX (405)466-3381 email  
pjschapiro@lunet.edu

**University of Central Oklahoma**  
**Co-PI** Dr. S.N. Rao

**Northwestern Oklahoma State University**  
**Co-PI** Mr. Billy Stewart  
Professor of Mathematics  
Alva, Oklahoma 73717-2749  
(580)327-8580; FAX (580)327-1881  
email bastewar@minnie.nwalva.edu

**OKLAHOMA STATE REGENTS FOR  
HIGHER EDUCATION**

Dr. Dolores Mize, Research Analyst  
Oklahoma State Regents for Higher Education  
State Capitol Complex  
500 Education Building  
Oklahoma City OK 73105-4500  
405-524-9196; Fax 405-524-9230  
dmize@osrhe.edu

---

Office of Asst. Dean, Graduate College  
Edmond, Oklahoma 73034-0170  
(405)341-2980 X2524; FAX (405)341-4964;  
email SNRAO@AIX1.UCOK.EDU  
**Campus Coordinator:** Dr. David Boliver