

# Lawson State COMMUNITY COLLEGE

## Unit Plan Annual Narrative

**Directions:** Use the "Unit Plan Narrative Guide Sheet" to complete this planning form. Be sure that under each section, you write a narrative which discusses all elements listed under each heading. If a particular element does not apply to your area, note that within your narrative. Again, this form should be completed as a narrative, not bulleted.

Department/Unit: Natural Science & Math

Unit Administrator: Dr. Karl Pruitt

Date: June 5, 2007

### A. Unit Description

#### a. Connection of the unit to the institution's role and mission:

The Department of Natural Science and The Department of Mathematics were combined during the academic school year of 2001-2002. Prior to the 2001 academic calendar year the two departments were maintained separate each with its own departmental chairperson.

The tentative plans for the upcoming 2005-2006 academic year will have the combine departments separated back into two individual departments.

The Department of Natural Science and Mathematics now includes the disciplines of biology, chemistry, mathematics, physics, and physical science. Department Mission: The faculty of the Department of Natural-Science and Mathematics at Lawson State Community College believes that all students are important individuals who, although different from each other in background, talent, capability, and initiative, is entitled to an education that will enable them to realize their maximum potential both as individuals and as members of society. The Departments are designed for students who plan to receive an Associate in Science or Associate in Arts Degree in order to transfer to a four-year institution and purse a bachelor degree in biology, chemistry, mathematics, natural science, and other related fields of study. Moreover, a team approach is used in the development and planning of distant learning courses. Instructors are employees of the college and, as such, are just as accountable for the content and quality of instruction on or off campus. The instructor is responsible for maintaining current course content and making adequate and timely revisions when necessary.

The Department mission is to incorporate various teaching methods and strategies to encourage and motivate all students to achieve their maximum intellectual capability in the pursuit of their academic goals. The Department strives to develop innovative strategies that will strengthen the curriculum offered through the Natural Science and Mathematics. A comprehensive curriculum, instructional methods, new technological procedure is designed to enhance the student's critical thinking and problem solving skills. The continued success of Lawson State Community College and the Department of Natural Science and Mathematics is directly attributable to fulfilling the schools purpose and mission. Our divisional programs provide high quality transfer and career curricula; continuing education, and community services in response to the local community and educational needs of our diverse student population. The Office of Institutional Research concluded that a large percentage of our faculty strongly agree that the college programs of study are directed by a clearly defined statement which supports our mission statement for Lawson State Community College.

The Department of Natural Science & Mathematics at Lawson State Community College believes that all

students are important individuals who, although have different ethnic backgrounds, talents, capability, and initiative, are entitled to a quality education that will enable them to realize their maximum potential as individuals and as productive members of society. The Natural Science & Mathematics Department is a rapidly advancing discipline whose curriculum designs and instructional presentation play is a critical role in their academic growth and maturity. Mathematics has always been an essential component in the physical sciences, chemistry, and physics programs, and has been applied extensively in such diverse carriers as medical and biological research, environmental studies, management science, behavioral and social science.

### **THE DEPARTMENT OF NATURAL SCIENCE PROGRAM OBJECTIVES:**

The Department of Natural Science offers a degree in Associate in Science, which requires 64 semester hours for graduation. The Natural Science and Mathematics Department is actively involved in a bridge program with University of Alabama in Birmingham in which selected students can pursue a bachelor degree. These students can complete their junior and senior years in their related fields of study (Biology, Chemistry, Mathematics, Pre-Medicine, Pre-Pharmacy, Pre-Engineering, Pre-Dentistry, Medical Technology, and Physics), through an established articulation agreement with U.A.B., Miles College, Birmingham Southern and Montevallo and other in-state four year colleges and universities.

Distance learning courses are included in the curriculum of a particular program and are regulated by the same policies as though conducted in a classroom on campus—they are held to the same standards. The same goals, objectives, and competencies apply to distance learning courses.

#### **b. Unit Achievements:**

The Department of Natural Science & Math offers a degree of Associate in Science, which requires 64 semester hours for graduation. Presently, the Natural Science & Math Department is actively involved in developing a bridge program with the University of Alabama at Birmingham and with Miles College in which selected students can pursue a bachelor degree. Distance learning courses have been included into the curriculum and are regulated by the same policies and standards as those courses conducted in classrooms on campus. Indeed, they share the same goals, objectives, and competencies.

1. To strongly increase the recruitment of qualified students into the varied programs that the department offers.
  - i. Increase college scholarship designed for science and health related majors.
  - ii. Establish and maintain more bridge programs with four-year institutions such as Miles College and University of Alabama in Birmingham.
  - iii. Encourage students to participate in more summer research programs related to science and technology.
  - iv. Provide College tours for regional high school students interested in science and math to visit our campus, meet our faculty in the department, and see our science and computer labs.
2. To increase the fiscal budget to include an increase in hiring more faculty and staff ( i.e. full time biology instructor, full time mathematics instructor, part time laboratory assistant, and a departmental secretary ). Increase the budget to allow for renovation of three more science labs.
3. To encourage more faculty to attend at least four professional development workshops throughout the academic year.

4. To acquire 30 new computers for the math and science computer lab.
5. Purchase new equipment and supplies for the two new renovated labs in the science building; Labs C-205 and B-125.
6. Purchase new lab top computers and LCD-Projectors to implement more technology into the instruction process.
7. Provide a tutorial program for math and science majors.
8. Encourage more students to participate in summer research programs.
9. Provide students with the knowledge to assess and express scientific and mathematical ideas.
10. Develop methods for assessing students learning and aligned that data with the curriculum.
11. Provide students with the mathematical and scientific knowledge to transfer to other institutions of higher learning.
12. Teach students those mathematical concepts needed to successfully enter industry, working in mathematics related areas.
13. To provide quality curriculum to ensure students will develop an appreciation for scientific technology and for humanitarian and cultural values.
14. Provide a structured environment of advisement that will aid students in developing realistic academic goals.
15. Incorporating diverse teaching methodologies to enhance students learning.
16. Develop a standardized course outline, curricula, and grading policy within each program of study.
17. Fostering strong community involvement and work force development by supporting local and state economic growth and encouraging civic, cultural, recreational and service activities.
18. Developing a diverse array of academic, developmental, and support services to help in student retention, and increase the number of completers per degreed and certificate programs.
19. The Bridges to the Baccalaureate Program with the University of Alabama in which selected students can attend Lawson State Community College and later transfer to UAB or Miles College to pursue a bachelor degree.
20. HBCU-STEP-UP in STEM Program which encourages students in the 10<sup>th</sup>- & 12<sup>th</sup> grade in the areas of science, technology, engineering, and mathematics.
21. The department has two instructors who attended the University of Alabama Doctoral Program.
22. One Instructor to attend a science/health seminar.
23. 100% of full and part-time faculty use BlackBoard in their instruction.

**College Transfer:** The cohort of students from Fall 2003 through summer of 2006 had enrolled 711 first time/full time students. At the end of the three year period 184 students completed out of the 711 total students, from the 711 students total 125 students transferred to a four-year institution over the three year period. During the academic year of 2005-2006 there were 24 students that received an Associate in Science Degree and 27 students in 2006-2007.

**c. Support Services Connection & Resource Availability:**

The Natural Science & Math Department is located in the Academic and Science Building and shares 30 new computers with the Natural Sciences and Mathematics Students to assist in their technology skill through the use of I learn a virtual lab. The laboratory contains a 45-inch TV monitor, overhead projector, VCR, and DVD system. The Natural Science and Mathematics Department had 5-new LCD projectors installed in rooms B-111, B-121, C-105, C-100, and C-200. The Natural Science and Mathematics Students also have assessed to the developmental laboratories for use of the computers to assist in their writing and technology skills. There are several resources available in the Library to assist the Natural Science and Mathematics Students. There are several classrooms on the B-hall and C-hall with an average seating capacity of 35 students per classroom.

All full-time faculty members have access to technology through laptop computers and LCD Projection Systems for instruction in classroom. Most classrooms have internet access so instructors are able to use the form of technology in the classroom.

**C. Value Added**

**a. Strengths:** The strength of the Natural Science & Math Department can be observed through student performances on Lectures' exams, quizzes, laboratories and the demonstration of competence while advancing through various course curricula. The department strength will be mainly attributed to the enthusiasm, professionalism, commitment, intelligence, and dedication of the faculty members to students and to the mission of the college and the support of adjunct faculty. The demand for office space is a strong indicator of how fast the department of Natural Science & Math is growing in terms of faculty and students. Other strengths include the following:

1. All full-time faculty share information pertaining to lecture materials and new methodologies.
2. All faculties attend professional development workshops.
3. Faculty members are encouraged to join professional organization to remain current with new teaching techniques.
4. Faculty is encouraged to promote educational collaboration with other four-year institutions.
5. Faculty is encouraged to initiate support and implement programs identified to be of economic importance to the college and the community.
6. The department makes sure departmental budgets and all expenditures comply with state regulations and meet the needs of the college.
7. All faculty members are part of some institutional committee of the college.
8. Encourage faculty to participate in grant writing workshops.
9. Some faculty members are involved in federal funded programs which provide mentoring of middle and high school students.
10. Faculty members are pursuing advanced degrees.
11. Faculty in both Biology and Mathematics devote personal time in the computer laboratory to tutor science students.

**AREAS THAT NEED IMPROVEMENT:**

1. The program needs more full-time faculty in the area of biology and mathematics.
2. To purchase equipment and supplies more fiscal resources will be required.
3. The program needs two computerized classrooms and a writing laboratory.
4. There is a need for tutorials in the area of biology, chemistry, mathematics, and physics.
5. The program needs a new Biology instructor for the Bessemer campus based on increase enrollment.
6. The faculty members' offices need to be remodeled and furnished to allow easy access to teaching materials and to provide a much more stimulating environment.
7. There is a need for technology training in Blackboard and Tegrity.
8. The program needs to develop a technology committee for college transfer programs.
9. The full-time faculty needs LCD projectors in every classroom.
10. Full and part-time faculty need to implement Blackboard as part of the continuous evaluation process of students' papers and grades in the natural Science and Mathematics Department.
11. The department needs more fiscal resources to support two campuses successfully.

The program needs to implement more computer technology assistance and support in the Natural Science & Math Department, and learning resource tools, such as video equipment, TV's, audiovisual aids, and more computer software to assist students in terms of grammar, sentence structure, style, critical thinking and , problem solving skills

**d. Departmental or Unit Needs:**

It would be helpful to have additional faculty in the area of biology and mathematics to support the increase in enrollment in the Natural Science and Mathematics area. An increase in the Natural Science and Mathematics Budget to support the growing demands of the department, to provide adequate instruction for our students.

**e. Recommendations:**

The Department of Natural Science and Mathematics needs more instructors to meet the growing needs of the student population on two campuses. In addition, the department needs more fiscal resources to implement more course offerings between two campuses, along with more financial resources to maintain technology in the instructional delivery of the faculty.

The Department of Natural Science and Mathematics has greatly improved its intellectual climate over the past several years. However, in order to ensure continuous high quality of instruction and sound institutional programs, the department will attempt to implement and complete the following plans:

1. Provide a seamless transition into four-year institutions.
2. Provide continuous quality instruction.
3. Support the development of a technology-integrated curriculum.
4. Hire full time faculty members for Biology, Chemistry, and Mathematics..
5. Develop online course offerings in Mathematics (Distance Learning offerings and Hybrid Courses). Hardware and software is needed
6. Hire full-time computer laboratory assistant.
7. Hire tutors for the Sciences laboratory (short-term and long- term goal)
8. Renovate the science labs in room C-203 and C-207.
9. Establish dual-enrollment, articulation agreements with local High Schools and four-year institutions.
10. Provide greater access to highly motivated scholastic achievers in Natural Sciences and Mathematics and enhance enrollment in the Department.
11. Seek funding to increase faculty development and grant procurement.
12. Increase faculty involvement in the community.
13. Encourage full-time faculty to continue their professional growth plan at the college.

Purchase more Tegrity equipment, LCDs and/ or White Boards to enhance the delivery of instruction in the classroom

#### **D. Projections**

##### **a. Staff needs:**

The Natural Science and Mathematics Department is in need of an additional instructor.

b. Resources needs: More fiscal resources and more office and classroom space for the growing enrollment of science and math students between two campuses.

c. Professional development needs: All faculties in the division of Natural Science and Mathematics are encouraged to pursue professional growth in there field of specialty. This area is evaluated during the spring of each academic year during faculty evaluations.

d. Other (if applicable):

24. The Biology and Mathematics faculty use different forms of technology in the classroom i.e. I-learn in mathematics and biology.

**c. Instructional Units within your division:**

The Natural Science & Math Department have degree offerings in Biology and Mathematics. The Department also offers courses that support the General Education Degree programs.

**B. Unit Effectiveness**

**a. Staff Description:**

There are six full-time faculty members in the Natural Science & Math Department. In the Fall, there were 12 adjunct faculty members teaching several classes ranging in the fields of biology, chemistry, mathematics, physical science, and physics. In the Spring, there were 12 adjunct faculty members teaching several classes in the Department. In the summer, there were 2 adjunct and two full time faculty members teaching biology and mathematics courses due to increase enrollment and the need to support full time employment for the full time faculty members of the newly merged Bessemer campus with Lawson State Community College. The college has increased its offering of college transfer courses on the Bessemer campus since the merger. There are several biology courses offered each semester on the Bessemer campus which populates each semester. Biology 101, Biology 103, Biology 201, and Biology 202 are offered each semester, and beginning in the Fall 2007 academic year Microbiology BIO-220 will be offered. The number of Mathematics courses is gradual increasing each semester. With the introduction of the Night RN program beginning in the Fall 2007 on the Bessemer Campus should lead to an increase in enrollment in several mathematic courses, along with several General Studies courses.

The ratio of full-time to part-time faculty members varies each semester based of the college enrollment.

**b. Instructional Effectiveness / Student Success:**

The Natural Science & Math Department is one of service to the institution and to all departments within the academic area. The department and the college provides tutoring services for its students through student support services and individual tutoring provided by faculty in the division, and through online support such as Criterion. The department is levering for financial resources to purchase 30 new computers to start a Natural Science and Mathematic laboratory. This laboratory will have highly trained tutors to ensure the success of our students. About 65% of students that receive an Associate in Science Degree transfer to a four-year college/university. The natural science Division had seven graduates to complete in biology over the period from 2005-2006 and seven graduate in Biology for the academic year of 2006-2007. There were 14 total graduates in biology over the past two academic years. There was one graduate in the mathematics department for the academic year of 2005-2006.

**Student Progress:** PLEASE REFER TO GRADE DISTRIBUTION for The College Transfer FOR Fall and Sprng 2006-07 is attached to this document.

**Graduation Rate:** There were seven graduates in biology for spring 2005-2006. There were seven graduates in biology for 2006-2007. There was one graduate in mathematic for summer 2005-2006.

## Institutional Effectiveness Unit Plan 2006– 2007

**Directions:** Use 9 point font when completing this form. First, complete columns A-D. Make sure your Unit Outcomes are targeted, essential and measurable. Columns E & F (which serve to assess whether your goals were reached and how you intend to use the results) will *not* be completed until the end of the cycle in the spring.

**Unit:** Natural Science and Mathematics

**Unit Administrator:** Karl Pruitt

**Unit's Mission:** School Year: 2006-2007

**Unit's Mission:** The curriculum is designed to prepare students for a successful transition from the two-year college to the four year college/university; to major in Biology, Mathematics and/or related Health fields.

Number each outcome in each column	A. Unit Outcomes (3-4) no more	B. Outcomes Link to Institutional Goals & Strategic Indicators	C. Methods of Assessing the Outcome	D. Budget Implications
	<p>Should be measurable. Use percentages where possible. <u>Be brief.</u></p> <ol style="list-style-type: none"> <li>100% of faculty will participate in some form of professional development to improve their teaching methodologies.</li> <li>100% of Natural Science faculty will actively participate in the academic advising of Lawson State students each academic semester.</li> <li>2a. Development of a Math and Science Club to increase student interest in the Natural Science field and to provide some mentoring capabilities for science majors.</li> <li>100% of all Natural Science faculties should incorporate some form of technology into the course curriculum as well demonstrating college level speaking and writing skills.</li> <li>The Natural Science Department will purchase current equipment and supplies to help facilitate student learning in science related courses.</li> </ol>	<p>List the goal numbers and the corresponding Strategic Indicator letters (i.e., Goal 1; Indicators B &amp; C; Goal 2; Indicators A-C, etc.)</p> <ol style="list-style-type: none"> <li>Goal 1; Indicator A, B, D Goal 2; Indicator B, C, D Goal 3, Indicator A Goal 6; Indicator A-F</li> <li>Goal 2; Indicator A, B, C, F &amp; G Goal 6; Indicator A-F</li> <li>Goal 1; Indicator A, B, &amp; C Goal 3; Indicator A, B, C &amp; D</li> <li>Goal 1; Indicator A, B, &amp; C Goal 3; Indicator A, B, &amp; C Goal 6; Indicator A, B, &amp; D</li> </ol>	<p>List what methods you plan on using to measure each outcome (i.e., exit exam results, portfolios, surveys, board exams, etc.)</p> <ol style="list-style-type: none"> <li>This goal can be addressed through the faculty mid-year evaluation and end-of-year evaluation, which list their professional development activities from the previous year and the anticipated goals for the upcoming year.</li> <li>This goal can be address by compiling a list of advisees for each full-time faculty member and having them maintain a file of their advisees. In addition; the department chairperson maintains an advising schedule for each full-time faculty member during the registration process each semester. This goal can be measured by maintaining a list of members of the science club and a list of there social activities.</li> <li>This Unit Outcome can be measured through class observation, syllabi, laboratory reports, research papers, and group participations in class.</li> <li>This Unit Outcome can be measured through Student Learning Outcome success as well as comparing the pass/fail rate for science students.</li> </ol>	<p>If your outcome has budget implications (costs that will exceed \$499), list them here.</p> <ol style="list-style-type: none"> <li>To increase the fiscal budget to cover the cost of implementing new types of professional development workshops on campus and to provide fiscal resources for faculty to attend off campus professional development workshops that deal with technology and instructions.</li> <li>To increase the fiscal budget to purchase materials and supplies to maintain an academic aggressive curriculum in the Natural Science Department. To develop brochures and program material to highlight the curriculum and carrier opportunities Biology and Mathematics major can be involved in.</li> <li>To increase the fiscal budget to hire more qualified instructors and provide more opportunities for current faculty to attend professional development workshops to remain current with new technology and new innovating teaching methodologies.</li> <li>To increase the fiscal budget to purchase adequate science equipment and current mathematics equipment such as graphing calculators and smart boards and Tegrity equipment.</li> </ol>

**Unit Plan Part II: Directions:** As noted on page one of this plan, complete columns E & F at the end of the planning cycle the spring. As you report under each column, be sure to carry over the numbers which represent each outcome you are addressing.

**E. Actual Results Obtained**—When you assessed and measured your stated outcomes, what results did you find? Be clear and concise in your reporting.

1. 100% of science and mathematics faculty are interacting with other science and math teachers at other colleges and universities to exchange ideas relating to new and innovative teaching methodologies.
2. 100% of the Science and Mathematics faculty have attended professional development workshops to remain current with new ideals in science and mathematics. Some of the science faculty presented at professional conferences this academic year of 2007-08.
3. 100% of Natural Science faculty incorporated technology into the classroom i.e. power point with LCD projectors, Graphing Calculators, interactive laboratory software dealing with human and cat dissection. 100% of biology students who made a "C" or better in selective biology course such as BIO201, BIO202, and BIO220 demonstrated the ability to write and speak on the college level through laboratory reports and research papers.
4. Between fall and spring 06-07 academic year there was a 77.87 pass rate for fall and a 78.68% pass rate for spring with a 6% fail rate for the fall and a 18% fail rate for the spring in BIO201; FOR bio202 the pass rate for the Fall is 77.7% with a 10% fail rate and for the spring a 82.1% pass rate and 9% fail rate. For BIO220 the pass rate for the fall is 79.7 with a 7% fail rate and for the spring and 81.25 pass rates with a 12% fail rate.

**F. Use of Results**—Now that you have your results, how do you intend to use these results or, if implemented early, how have you used these results to improve your overall unit for the upcoming academic year? **NOTE:** After you list how you intend to use these results, be sure to include such improvements in your new Unit Plan for the upcoming academic year.

1. To develop and implement an instructor workshop with local instructors from regional high schools, colleges and universities to discuss different and innovated teaching strategies. To organized a working meeting with Lawson State MIS department to develop an online survey for faculty.
2. To provide more fiscal resources to ensure that faculty can continue to attend more professional development workshops.
3. Purchase more scientific equipment to ensure that a high level of instructions continues in the Natural Science Department. To hire more qualified instructors to maintain the academic integrity and curriculum of the department.
4. To incorporate different teaching styles in the classroom and laboratory to ensure that students are getting a good understanding of the material being delivered.