REFLECTIVE STATEMENT ON TEACHING AND LEARNING

Judy Awong-Taylor, Armstrong Atlantic State University

In this reflective narrative I will attempt to convey to you my thoughts, ideas, beliefs and philosophies on teaching and learning. What may be more difficult to do is to convey to you the love, passion and dedication that I have for my profession. My teaching career started when I was just fifteen years old and had recently completed my senior year AO-level@ exams (British system). I was asked to be a substitute math teacher (5th grade equivalent) for a teacher on medical leave. At the time, I did not think anything unusual about this request. Throughout my high school career, I had the knack of explaining difficult concepts to classmates (especially in math) and on many occasions was asked by teachers to Acome up and explain to the class@ a particular topic. When I graduated from high school, I did not consider teaching as a career option. Instead, I had grand plans of becoming a leading scientist whose work would benefit mankind and the world! It was not until graduate school that I had the opportunity to become a graduate teaching assistant and was reintroduced to the world of teaching. I discovered that I loved the challenge of making students truly *understand* difficult concepts and problems, instead of just trying to memorize facts. I also found it extremely gratifying to engage students in discussions and to make them excited and interested in their work. I did not think of teaching as a job, but rather as a tool for making a positive impact on a student=s life. This was the start of my teaching career.

Since that time my basic goals and teaching philosophies have not changed, but I have discovered that teaching is not just Aone tool,@ but instead consists of a variety of tools, each serving a unique purpose. To be an effective teacher, one must realize that not all students learn the same way. It is important to be able to discern these differences and provide a variety of teaching styles and learning tools for students. Teaching tools should vary depending on the course and the intended audience. Is the course an introductory, non-science course, an upper-level biology course or a service-related course for another department? Is the course an Honors course or a traditional course? Is the course a lab-oriented or lecture oriented course? Are the students traditional or non-traditional students? Different situations require different pedagogical approaches. The ultimate goal however remains the same, to inspire my students to learn and succeed, to be excited about biology, and to realize their true potential.

To help accomplish my teaching goals, I believe in being well organized and well prepared for my classroom lectures and labs. While I am often told that I am an energetic and enthusiastic lecturer, this is not something I practice or plan. My enthusiasm and excitement come from my love for teaching and is simply reflected in my lecturing style. I believe that learning is not about memorization and regurgitation, but instead begins with thinking, analyzing and understanding the concepts being taught. To accomplish this, I use a variety of methods designed to help students to better understand and visualize difficult concepts. I use various analogies and visual aids (pipe-cleaners, Styrofoam and paper models) in many of my courses to illustrate mitosis and meiosis, or levels of protein organization or DNA replication. Many students follow my example and use these tools for studying purposes. Many students have commented on the usefulness of this strategy.

Encouraging and engaging students in discussions is another teaching tool that I commonly use. This is particularly effective in laboratory sessions where students tend to be more relaxed and open to dialog. I openly encourage students to introduce themselves, to talk among themselves, to discuss their results and conclusions, but as the same time be responsible for their own work. I have successfully used discussion formats in Honors courses and upper-division Biology courses. My students consistently tell me that this format is enjoyable and effective.

As a scientist, I strongly believe that laboratory components are excellent teaching tools for reinforcing lecture materials. Laboratory exercises provide important hands-on learning experiences for students. For this reason, I always try to include relevant, up-to-date, intellectually challenging labs into my lab curricula. This usually involves additional prep work for me but it is worth the extra time and effort, especially when students tell me that they have learned so much from the labs. In an effort to update our curriculum in the area of cell and molecular biology, I developed two new laboratory courses, Modern Biology

Laboratory (BIOL 30101) a required core-biology course, and Molecular Biology (BIOL 4090) an upper division elective. These courses incorporate many of the Amodern@ laboratory techniques, such as DNA manipulations, gel electrophoresis, PCR and DNA fingerprinting, that are commonly used today in many technology-based labs. In addition to developing these new courses, I was able to fully equip these labs with state-of-the-art equipment through an NSF Instrumentation and Laboratory Improvement Grant ($43,000). I also developed, organized and wrote a lab manual for the Modern Biology Laboratory course.

More recently, I led an effort to restructure our Introductory Biology (BIOL 1107) curriculum. As part of the restructuring, we redesigned our laboratory component to include activities that involved use of the scientific method, active learning activities, problem solving processes, and group activities. These are all excellent teaching tools for engaging students in the lab. The restructuring of the labs resulted in the publication of two laboratory manuals entitled *Investigations in Biology I: Laboratory Manual, 2nd Ed.,* Outernet Publishers, and *Investigations in Biology II: Genetics, Evolution and Biological Diversity Laboratory Manual,* Outernet Publishers. My colleagues and I continue to write and submit *Teaching and Learning Grants* for the purchase of equipment for student use and to enhance the quality of teaching.

An effective teacher should provide students with rigorous, challenging but up-to-date curricula. I try to accomplish this by keeping abreast of current research and findings. I subscribe to several on-line journals within my discipline, and also subscribe to AScience News,@ a weekly publication that highlights important publications in the natural sciences. I also keep in touch with teachers and colleagues within my discipline via the American Society for Microbiology=s Educational Listserv internet service. My commitment to setting high standards is also evident in my involvement in the restructuring of the Introductory Biology curricula, the publication of two lab manuals that are specifically geared to enhance student learning, the development of an Honors Introductory Biology course, and the development of two fully equipped molecular labs. I use a variety of testing methods, each dependent on the type of course I teach. Students are evaluated using a variety of methods, including multiple choice questions, matching, true/false, short answer questions, essay type questions, class participation including group discussion, research projects, library assignments, and lab reports and assignments.

The use of research can also be used as an effective teaching tool. Some of my proudest and most satisfying experiences as a teacher have been outside the classroom setting serving as a mentor and research advisor. I enjoy the challenge of bringing out the best in students, especially among those who are unaware of their own talents and potential. Many of my students have the potential to be bright, future leaders. I encourage these students to engage in independent research. With the right amount of cajoling, encouragement and advising, students develop critical thinking skills, solve their own problems, improve their oral and written skills and most important, gain confidence in their own abilities as effective thinkers and future leaders. I also strongly encourage students to present their work at regional or national conferences. It is a rewarding experience for students to be able to present and discuss their research projects to their peers. Many of these students have gone on to pursue studies in graduate school or medical school.

In addition to what I have listed above, I also consider the following factors important for student learning and student success. *I encourage students to communicate with me.* I have an open door policy and am open to comments and suggestions at any time during the semester. I usually take the time as the semester progresses to inquire about my teaching style. *I encourage questions and discussions in class.* I often use examples of real life situations or case studies to stimulate discussions. *I try to supplement my lectures with handouts so students can focus more on my lectures.* In order to avoid the potential problem of non-attendance, I limit the contents of my handouts to key statements. *I use a variety of teaching styles.* I enjoy using the traditional Achalk and backboard@ teaching style. This allows me to move around the classroom and actively engage the students. I supplement this with transparencies and the occasional PowerPoint lecture. Finally, *I make sure that students know what my expectations are for the course.* My standards and expectations are high, and I try to prepare students for this. Students in my classes know that they alone are responsible for their grade and I am there to help them be successful in the class.

In addition to my teaching and research responsibilities, I also serve as Advisor to the Biology Club and the *Beta Beat Beta* Biological Honor Society. Over the years, I have been able to use my role as advisor as an effective teaching tool. I believe that a student=s education is not only about acquiring new skills and knowledge obtained from the classroom but should also include learning about morals and values that will allow them to become better citizens and leaders in the community. As advisor to the Biology / *Beta Beat Beta* Club I can help to accomplish this. I use this role as an opportunity to teach responsibility, resourcefulness, time-management, compassion and caring, corporations, and at the same time emphasize leadership ability among students. I am truly proud of the activities and accomplishments of the Biology / *Beta Beta Beta* Club, which includes free tutoring for our introductory biology courses, charitable community events, volunteer work, and involvement with numerous campus activities.

At this point, I would like to comment briefly on my involvement in PRISM (Partnership for Reform in Science and Mathematics). PRISM is a NSF-funded Math Science Partnership grant intended to raise expectations and student achievement in science and math in P-12 schools. The grant encourages the interactions between higher education faculty and P-12 school teachers. I have embraced the concept of PRISM from it=s beginning. Here was an opportunity for me to help shape the lives and future careers of our youngest students. I have spent many hours working with P-12 teachers and also with their students and it=s gratifying to know that I have played a role in the education of our future generation.

In summary, my teaching philosophy in many ways is deeply rooted in tradition. I believe in many of the simple yet effective strategies that have been successfully used in classrooms for centuries. I try to provide rigorously and intellectually challenging courses to my students, yet at the same time promote a supportive and exciting learning atmosphere for them. I care deeply about the progress of my students and for many I try to be an effective mentor and advisor. I also try to instill a sense of respect, compassion and understanding both in and outside the classroom. I have enjoyed my role as an educator, mentor, and advisor, and along the way have developed close friendships with many of my students. My students have all succeeded in their chosen careers. Many have obtained their Ph.Ds and are actively involved in cutting edge research. I choose teaching as my career, but it is through my students that I continue to fulfill my childhood ambition to be a great scientist and to make a difference in society.

I would like to end this narrative by thanking Armstrong Atlantic State University for the tremendous support I have received over the years and for its commitment to excellence in teaching. I am truly honored by this nomination.

CONDENSED CURRICULUM VITAE

DR. JUDY AWONG-TAYLOR, Department of Biology, Armstrong Atlantic State University, Savannah, Georgia 31419. Phone: 912-921-2068, email: *awong-ju@mail.armstrong.edu*

EDUCATION

Doctor of Philosophy. University of Florida, Gainesville, Florida (1985-1990).
Master of Science. University of Florida, Gainesville, Florida (1981-1984).
Bachelor of Science. University of the West Indies, St. Augustine, Trinidad, West Indies (1974-1978).

ACADEMIC APPOINTMENTS

Interim Department Head, Biology Department, Armstrong Atlantic State University (Jan 2006-present)
Associate Professor of Biology, Armstrong Atlantic State University, Savannah, GA. (1993-present).
Associate Professor of Biology, Savannah State University, Savannah, GA. (1993).

TEACHING

Courses Taught: Principles of Biology I (BIOL 1107); Honors Principles of Biology I (BIOL 1107H) Microbiology: Organisms & Diseases (BIOL 2275); Microbiology (for majors) (BIOL 2010); Principles of Modern Biology (BIOL 2500); Modern Biology Laboratory (BIOL 3010); Bacteriology (BIOL 3510); Molecular Biology (BIOL 4090); Senior Seminar (BIOL 4800); Principles of Pharmacology (HLPR 2400), Research I (BIOL 4910); Research II (BIOL 4920); Internship I (BIOL 4950); Internship II (BIOL 4960)

Courses Developed: Honors Principles of Biology I , Microbiology (majors), Modern Biology Laboratory, Molecular Biology, Senior Seminar. The following courses were collaboratively developed: Principle of Pharmacology (HLPR 2400), Tropical Biology (new course for Summer 2006).

Lab Manuals Developed: *Modern Biology Laboratory Manual*; *Investigations in Biology I: Laboratory Manual, 2nd Ed.,* Outernet Publishers, and *Investigations in Biology II: Genetics, Evolution and Biological Diversity Laboratory Manual,* Outernet Publishers.

UNDERGRADUATE RESEARCH GUIDANCE at AASU

Over **forty** undergraduate students in **thirty five** different undergraduate research projects.

GRANTS ACTIVITY

2005. Craven, K. and Awong-Taylor, J. "Microbial Populations Associated with Unhatched Loggerhead Sea Turtle Eggs and their Possible Role in Embryonic Mortality". AASU Internal Faculty Research and Scholarship Grant. Awarded $1,980.00.

2005. Awong-Taylor, J. "Introducing Biological Concepts at the Kindergarten Level: A Hands-on Interactive approach". Principal investigator of a PRISM (Partnership for Reform in Science and Mathematics) mini grant. Awarded $2000.00

2005. "Enhancing the First Grade Science Curriculum Using a Hands-On Inquiry Based Approach.". Principal investigator of a PRISM (Partnership for Reform in Science and Mathematics) mini grant. Awarded $2000.00

2004. Nivens, D., Lynch W., Awong-Taylor, J., and Zettler, J. "Enhancing the Science Experience by Incorporating DNA Sequencing Into Interdisciplinary Biology and Chemistry Activities." LI-COR Biosciences Genomics Education Matching Fund program. Awarded $25,000.00.

2004. Zettler, J., Awong-Taylor, J., Collier A., Craven, K., and Green, R. "Using Digital Camera Microscopy to Enhance Classroom Instruction and Improve Student Performance". AASU Teaching and Learning Grant. Awarded $2,083.00.

2004. Awong-Taylor, J. "Introducing Biological Concepts at the Kindergarten Level: A Hands-on Interactive approach". PRISM Mini Grant. Awarded $400.00

2003. Green, R., Craven, K., Zettler, J., and Awong-Tyalor, J. "Computer Aided technology for Biology Teaching, Learning, and Research". AASU Teaching and Learning Grant

1999 Awong-Taylor, J. and Taylor, S. "Effects of Selected Toxicants on Reproductive Behavior and

Learning". AASU Internal Faculty Research and Scholarship Grant. Awarded $1,033.00.

1997 Larson, B., Awong-Taylor, J., Guillou, L., Thorne, F., and Beumer, R.. USG Teaching and Learning Grant entitled "Use of HyperCELL in Upper Level Biology Courses". Awarded $19,000.

1996. Awong-Taylor, J. and Larson, B. NSF-ILI Grant Proposal entitled "Improvement of a Molecular Biology Laboratory that Enhances Core Curriculum Instruction". Awarded $43,023.44.

AWARDS & HONORS

2005 AASU's nomination for the Regent's Teaching Excellence Award
2005 Research selected and highlighted for ASM press release. 150th General Meeting of the American Society for Microbiology, Atlanta GA.
2005 Research selected and highlighted for ASM MicrobeWorld. 150th General Meeting of the American Society for Microbiology, Atlanta GA.
2004 AASU's nomination for the Regent's Teaching Excellence Award
2003 AASU's H. Dean Propst Award, University's highest award for Teaching Excellence
2003 AASU Outstanding Advisor Award
2001 Selected and featured in AASU's Excellence in Research and Scholarship Magazine
1996 Kristina Brockmeier Faculty Teaching and Service Award, Armstrong Atlantic State University

RECENT AWARDS RELATED TO STUDENT SUCCESS (Student Research Advisor)

2006 Two Undergraduate Level Student Awards (of five awards) at AASU's 12th Annual Student Research and Scholarship Exhibition.
2005 Two Undergraduate Level Student Awards (of five awards) at AASU's 11th Annual Student Research and Scholarship Exhibition.
2004 Two Undergraduate Level Student Awards (of five awards) at AASU's 10th Annual Student Research and Scholarship Exhibition.
2003 Two Undergraduate Level Student Awards (of five awards) at AASU's 9th Annual Student Research and Scholarship Exhibition.
2001 First Place John C. Johnson Award in Poster Category at the Beta Beta Beta Southeastern Region Joint Meeting with The Association of Southeastern Biologists. New Orleans, Louisiana.
2001 Two Undergraduate Level Student Awards (of six awards) at AASU's 7th Annual Student Research and Scholarship Exhibition
2000 Third Place Award in Poster Category at the Beta Beta Beta Southeastern Region Joint Meeting with The Association of Southeastern Biologists. Chattanooga, Tennessee.
2000 Five Undergraduate Level Student Awards (of six awards) at AASU's 6th Annual Student Research and Scholarship Exhibition.

SERVICE

Selected AASU University Committees: Executive Committee; Leadership Advisory Committee; Finance Committee, Committee on Instructional Work Group for Student Success Initiatives; Academic Council; Honors Advisory Committee, Arts & Sciences Curriculum Committee; Leadership Task Force Committee; Hallmarks Advisory Task Force Committee
Selected AASU Departmental Committees & Activities: Chair, Introductory Biology Curriculum Committee; Chair, Biology Honors Committee; Advisor to the Biology Club; Advisor to AASU's Beta Beta Beta Biological Honor Society; BioPsychology Program Committee; Biology Seminar Coordinator
Selected Professional Service Activities: State of the Art in Biology (SOTAB) Organizing Committee; PRISM (Partnership for Reform in Science and Mathematics) Associate; Ossabaw Island Education Alliance.

SCHOLARLY ACTIVITIES

Seven peer reviewed publications, over 50 paper/poster presentations (most with students) and fifteen invited lectures/presentations. Presented at 39 regional, national or local meetings.

Recent Selected Talks and Student Poster Presentations: ***Student's names are highlighted***

Awong-Taylor, J. 2006. The Invisible World Around Us: Introducing Microbiology to Elementary School Students. Week of the Young Child Conference. Savannah, GA.

Craven, K., Awong-Taylor, J., **Griffiths, L., Bass, C., Muscarella, M**.. 2006. Microbial Populations Associated With unhatched Loggerhead Sea Turtle (Caretta caretta) Eggs: A Comparison of Traditional and Molecular Identification Techniques. Oral presentation at the 26th International Symposium on Sea Turtle

Biology and Conservation, Crete, Greece.

Griffiths, L., Bass, C., Muscarella, M., Awong-Taylor, J., and Craven, K. 2006. Using traditional and Molecular Techniques to Determine if Microbial Contamination Plays a Role in Embryonic Death of Loggerhead Sea Turtle Eggs.. Florida Academy of Sciences, Melbourne, FL.

Whitehead, E. and Awong-Taylor, J. 2006. Broth Microdrop assay: A More Sensitive Test for Determining Antimicrobial Properties of Viscous Substances. AASU's 12th Annual Student Research and Scholarship Exhibition.

Tanya Collier, Laura Griffiths, Jennifer Griffin, Judy Awong-Taylor, and Kathryn Craven. 2005. *"Microbial Characterization of Unhatched Loggerhead sea Turtle Eggs and Its Implication in Embryonic Development and Death"*. 11th Annual AASU Student Scholarship Symposium.

Eva Whitehead, Tanya Collier, Judy Awong-Taylor, and Jennifer Zettler. 2005. *Investigating the Source of Fecal Contamination Along the Ogeechee River*. 11th Annual AASU Student Scholarship Symposium.

Craven, K., **Griffiths, L**., Awong-Taylor, J., **Collier, T., and Griffin, J**. 2005. *Microbial populations Associated With Unhatcged Loggerhead Sea Turtles (Caretta caretta) Eggs and Their Possible Role in Embryonic Death and Development.* 150th General Meeting of the American Society for Microbiology, Atlanta, GA. June 2005.

Collier, A, Awong-Taylor, J., **Bates, L., Delano, F., and Posyton, T**. 2005. *A Comparison of the Antimicrobial Properties of Amphibian Skin Secretions*. 150th General Meeting of the American Society for Microbiology, Atlanta, GA. June 2005.

Recent PRISM Presentations:

Awong-Taylor, J., and J. Zettler. 2005. Epidemic Proportions: How Does An Infection Spread? PRISM Mini-Conference, Brunswick, Georgia.

Awong-Taylor, J., J. Zettler, and R. Warbington-Wells. 2005. Pass It On: Human Genetics Experiment. PRISM Mini-Conference, Brunswick, Georgia.

Craven, K., Awong-Taylor, J., and J. Zettler. 2005. Beyond The Classroom: Using Field Trip Activities to Enhance the Classroom Curriculum 1st Annual Southeast PRISM p-16 Teaching and Learning Conference. Savannah, GA.

Zettler, J., Awong-Taylor, J., and K. Craven. 2005. Designing Experiments for Students to Conduct Outside the Classroom. Ist Annual Southeast PRISM p-16 Teaching and Learning Conference. Savannah, GA.

PROFESSIONAL ASSOCIATIONS

American Society for Microbiology; American Society for the Advancement of Science; Association of Southeastern Biologists; International Society for Microbial Ecology; Society of Environmental Toxicology and Chemistry; Southeastern Branch of the American Society for Microbiology; The New York Academy of Sciences; Beta Beta Beta Biological Honor Society.

EVIDENCE OF TEACHING SUCCESS

1. Student Success:

I this section I will address not only my students' success but the department's general success as well. The Biology Department at AASU has seen a steady increase in the number of majors over the last ten years. The rise in majors can be attributed to a variety of factors, including a rigorous and challenging curriculum, a commitment to excellence in teaching, new and updated facilities, state of the art equipment and restructuring of the curriculum. I take great pride in knowing that I have played a significant role in the growth and development of the department. Over the years, I have developed and revamped new courses, some of which are now required courses for biology majors. I have authored or co-authored several equipment grants (totaling over $90,000) for our teaching labs. Most recently, I instigated the restructuring of our Introductory Biology curriculum. This collaborative effort by the faculty resulted in the publication of two laboratory manuals specifically written and designed to address and incorporate the scientific method, problem solving processes, active learning activities and group interactions. I also continue to encourage the integration of research into the undergraduate teaching curriculum. As advisor to the Biology Club and the Beta Beta Beta Biological Honor Society, I also spend a significant amount of time interacting with students and participating in student-based activities.

In addition to the steady rise in biology majors, we have also seen an increase in the achievements of our biology majors. For example, at this year's University Awards Convocation, our biology majors received some of the university's most prestigious awards, including the Governors Academic Recognition Day Award (Amanda Svendsen), the President's Cup for both male and female athletes with highest academic achievement (Patrick Sanou and Jeanna Short), and a Silver A Medal (Laura Griffiths) for highest GPA (only five awarded annually). Last year, biology majors Eva Whitehead was awarded the Governors Academic Recognition Day Award and Sarah Bohn and Juan Aragon received Silver A medals. While many people played a role in these students' achievement, I had the honor of working closely with most of these students, either in class or on research projects. In particular, I have advised and mentored Laura Griffiths, Eva Whitehead, and Juan Aragon on their research projects. In addition to academic awards, my students have also won numerous Research and Scholarship Awards. In the past five years, my students have received a total of seventeen Research and Scholarship awards.

I would also like to comment on the success of my former students. Although the department does not formally keep track of it's graduates, I have kept in close and constant touch with the majority of the forty students with whom I conducted research. Of these students, sixteen were admitted to graduate programs at both the masters and/or doctoral level. Of these, seven have completed or are close to completing their Ph.Ds. Eight of my students have completed or are currently in medically related fields, including medical, dental, veterinary, physical therapy and physician's assistant programs. Some have entered the teaching profession and are teachers, and one is an Assistant Principal. Several have jobs in local and regional state departments and some are working for private industry. Many have kept in touch and report that they enjoy what they do and are grateful for the education they received at Armstrong. I have been told many times that I was the driving force and inspiration for their success. I consider this a true testament of student success!

2. Selected Course Descriptions (condensed), Assignments, and Examinations.

In this section, I will provide a general overview of my course syllabi. I teach a variety of courses, some are both lecture and lab oriented while others are restricted to a laboratory component only. Course descriptions have been condensed due to page limitation. For each course I will highlight unique activities that I have developed and incorporated into the curriculum.

2a. The following condensed format is typical of a lecture and lab course. Microbiology is a required core biology course and is taught every semester. Classes meet three hours per week and labs meet twice weekly for a total of three hours. In this course, I encourage students to apply what I teach to their everyday lives. Students who take this course are often a mix of biology majors and health profession students. I therefore try to related the material taught to a wide variety of applications. Exam questions are a mix of multiple choice questions, matching, and true/false questions. Lab exams consist of short answers and a mix of multiple choice, matching, and true/false questions. In the lab component, I developed a protocol that would allow students to identify their unknown bacteria to genus and species. Students use a dichotomous key that I developed as a tool for their identifications. The dichotomous key took me several semesters to fully develop but it was worth the time and effort. This activity introduces problem solving, critical thinking and reinforces all the material covered in labs. More importantly, the students enjoy the activity.

Course Title and Number: Microbiology BIOL 2010

Course Description: This course is designed to introduce the student to some basic concepts in microbiology. Students are expected to have a fundamental background in general biology and some knowledge of basic chemistry. The organisms covered in this course include the bacteria, viruses, protozoa and fungi, with emphasis on the procaryotes. Topics covered include: structure and function, nutrition, growth, metabolism, genetics, microbial relationships, public health and epidemiology, environmental microbiology, food microbiology and industrial microbiology.

Exams: Five exams are given during the course of the semester. All exams are multiple choice, true/false, and matching. Exams 1 - 4 are worth 100 points each. Exam 5 (final lecture exam) is worth 150 points and will be comprehensive. Lab component is worth a total of 150 points. Please note: students must score at least 60% in the lecture exams in order to pass this course. Students must also pass the lab component to pass the course.

Grade Scale: A = 630 pts or greater; B = 560 - 629 pts; C = 490 - 559 pts; D = 420 - 489 pts; F = less than 420 pts.

Exam Policies: Please note that there will be **no makeup exams**. Any absence from a lecture exam is scored as a zero for the exam unless the absence is excused by the instructor. It is the student's responsibility to arrange with the instructor to take the exam within two days after the missed exam. No make-up exams will be given after this time! Please read your attendance policy handout regarding excused absences.

Attendance policy: **Both lab and lecture attendance are required.** The lecture attendance policy is provided to you on a separate handout. Please read the **attendance policy handout** carefully.

Lab Policies: *Students are expected to take all lab exams and perform all Identification of Unknowns. A missed lab exam will be scored as zero unless the absence is excused by the instructor. It is the student's responsibility to contact the instructor and make arrangements to take the missed exam **within two days after the missed exam**. *Students must perform and submit both Identification of Unknowns. Failure to perform or submit either Identification of Unknown will result in an automatic reduction of your final letter grade by one letter grade level. *Quizzes are given at the beginning of the lab period. If you come to lab late you will not be allowed to take the lab quiz. *Assignments must be turned in on the due date or earlier. Late assignments will not be accepted. *Students MUST pass the lab component in order to pass the course.

Lab Grading: Identification of Unknown I.....15 pts
Identification of Unknown II.....30 pts
Lab Exam I.....30 pts
Lab Exam II.....30 pts
Lab Exam III.....30 pts

Lab Quizzes.....15 pts

2b. Modern Biology Laboratory is a laboratory based course. It is a **1-credit**, required core biology course and meets once a week for four hours. Prior to developing this course, the department had no facilities to teach a cell and molecular laboratory. In recent years, molecular biology has become a standard in the field of science and I thought it was essential that all biology majors be exposed to the techniques commonly used in all modern cell and molecular biology laboratories. I therefore developed this course with that goal in mind. I obtained an NSF grant and lobbied for some internal funding to create and fully equip a molecular biology lab. This is a somewhat unusual course in that it is completely lab oriented. Laboratory manuals were not easily available at the time and those that were available were not appropriate for the course. I therefore developed and wrote a lab manual specifically for this course. In this course I focus on lab techniques and emphasize the theoretical aspects of the techniques. I encourage student to discuss their results but make them responsible for their own lab reports and exams. Exams are usually in the format of essays and short answers.

Course Title and Number: **Modern Biology Laboratory BIOL 3010**

Course Description: This course is designed to introduce students to some of the common laboratory techniques used today in cell and molecular biology. Students are expected to be familiar with materials previously covered in microbiology (BIOL 2010) and cell and molecular biology (BIOL 2500). Although the course is designed as a laboratory course, some general background information will be given at the start of each lab. Techniques covered in this course include micropipetting, DNA isolation and quantification, DNA restriction and electrophoresis, bacterial transformation, DNA fingerprinting and polymerase chain reaction, protein assays and/or immunological techniques.

***Grade Determination*:** Course grade will be based on lab exams, lab quizzes, and lab reports. Exam 1 is worth 25% of your grade and will include materials from Labs 1, 2, 3, 4, & 5. Exam 2 is worth 25% and will include materials from Labs 6, 7, 8, 9, 10, & 11. Lab Results/Reports are worth 25% and will be based on your lab results/lab reports. Lab Quizzes are worth 25% of your grade. Quizzes will be given at the start of each lab! Questions on the quiz will based on material and information from the lab that is scheduled for that day. Please read your labs before coming to class!!

Laboratory Exercises:

Laboratory One:	Measurements and Micropipetting
Laboratory Two:	Sterile (Aseptic) Techniques and Bacterial Culture Techniques
Laboratory Three:	Isolation of Chromosomal DNA
Laboratory Four:	Spectrophotometric Analysis of Isolated Chromosomal DNA
Laboratory Five:	DNA Restriction and Gel Electrophoresis
Laboratory Six:	Effects of DNA Methylation
Laboratory Seven:	Rapid Colony Transformation
Laboratory Eight:	DNA Fingerprinting Simulation: A Whooping Crane Paternity Case
Laboratory Nine:	Detection of an Alu Insertion Polymorphism by Polymerase Chain Reaction
Laboratory Ten:	Detection of a VNTR Polymorphism by Polymerase Chain Reaction
Laboratory Eleven:	Fish Protein Fingerprinting Using Polyacrylamide Gels

2c. Molecular Biology is an upper division elective course. This is a 4-credit, lab oriented course that meets eight hours a week (twice weekly). Since this is an advanced upper division course, I require students to conduct a molecular based research project and to present their data at the end of the semester in a poster format. In the past, I have also required students to give an oral presentation of their work instead of a poster. These research projects are often starting points for future projects and many continue their projects into the following semester. Students are also expected to maintain a log book of

their lab activities. Exams are often in the form of take home essay questions. Discussions are strongly encouraged in this course.

Course Title and Number: Molecular Biology BIOL 4090

***Course Description*:** This course covers both the underlying scientific principles and the wide-ranging industrial, agricultural, pharmaceutical, and biomedical applications of Recombinant DNA Technology. Emphasis is placed on the procaryotic bacterial cell and its genetic system. Eucaryotic and viral systems are discussed, but not in detail. The course focuses on the fundamental techniques used in cloning. Topics covered include: bioluminescence, restriction endonucleases, cloning vectors, construction and screening of genomic libraries, Southern Blots, DNA hybridization, restriction mapping, methods for purifying DNA fragments, Polymerase chain reaction, DNA sequencing, preparation of monoclonal antibodies, strategies for optimizing expression of a cloned gene, and procedures for modifying isolated genes. Applications of Recombinant DNA Technology in microbial and eucaryotic systems are also covered. The lab component of this course is very lab-intensive and is designed to introduce you to a variety of techniques used in molecular genetics and recombinant DNA technologies. In the lab, you will work with bacterial systems. During the course of the semester, you will isolate the *lux* gene from *Vibrio fischeri*, splice the DNA into a vector, and then transfer the recombinant molecule into *E. coli*. You will prepare a genomic library and screen for appropriate clones. You will also carry out plasmid isolations, restriction mapping, Southern Blots and DNA hybridizations. You will also perform polymerase chain reactions and a dry lab DNA sequencing exercise.

Grade Determination: Take-home exam (essay type): 200 points. Restriction mapping problem sets: 100 points. Log-book: 100 points. Research project: 200 points. All projects must be presented as a poster exhibit.

Selected Examination Questions:

1. Describe the mechanism of bioluminescence. Include in your answer how the *lux* gene may operate.
2. What are restriction endonucleases? Why are type II restriction endonucleases important in recombinant DNA technology?
3. Discuss the various techniques employed in gel purification.
4. Discuss plasmids and their role in recombinant DNA technology.
5. Describe the use of pBR322 as a cloning vector. What special features does it have or not have compared to other plasmid vectors such as pUC19 and pGEM?
6. Discuss alpha-complementation and its usefulness in recombinant DNA technology.
7. Describe the features that are common to all cloning vectors.
8. Describe the various ways to reduce the number of non-transformants in your cloning experiment.
9. What is meant by "insertional inactivation"? Discuss.
10. Discuss the differences between plasmid vectors, lambda vectors, cosmids and YACs. Include in your discussion the advantages or disadvantages for using a particular vector and factors that affect which vector is used.

3. Selected Student Comments from Evaluations

"Dr. Awong is the best professor in the Biology dept. She is able to give clear instructions of difficult subject matter, and make concepts understandable to students. High energy and very motivated. She has greatly enhanced my educational experience at Armstrong!

"Dr. Awong has been an extremely dedicated, kind, and flexible professor from day one. It is apparent that she had our interests in mind throughout the duration of the course. I throughly enjoyed both the lecture and lab components of this class. I felt as if they both supplemented one another very well. Thank you so much for this wonderful experience!"

“Dr. Awong is probably the best professor I have ever had. This is the fourth university that I have had the opportunity to attend and I have taken many classes. She explained some pretty complex material in an easily understandable manner.

“ I enjoyed this class very much. It has encouraged me more to follow my dreams of being a scientist one day”

“Thank you so much for understanding my fear of speaking in front of an audience. I have two more presentations before I graduate in December and this course was a real help!”

“This course was very interesting. One of the best I have taken at Armstrong. It is great to finally get hands-on experience with techniques that I have only read about.”

4. Complied Data from *Student Appraisal of Instruction and Course* (SAIC) Evaluations.

The following data is taken from AASU's Annual SAIC evaluations. I have complied the data to reflect my evaluations from 2002 to 2005. Data prior to 2002 are not included since the SAIC evaluation forms were changed in 2001. The data is broken down into lower-level courses (2000 level and below) and upper-level courses (3000 and above). Scores are based on a scale of 5 (high) to 0 (lowest).

	Upper-Level Courses				Lower-Level Courses			
	2002	**2003**	**2004**	**2005**	**2002**	**2003**	**2004**	**2005**
1.The instructor was effective in creating the educational experience	4.83	4.76	4.86	4.78	4.85	4.65	4.72	4.76
2. The course syllabus contained a clear schedule, grading criteria and assignments	4.86	4.91	4.89	4.83	4.79	4.7	4.76	4.72
3. The instructor graded in accordance with the conditions established in the syllabus.	4.65	4.93	4.74	4.84	4.85	4.68	4.73	4.83
4. The instructor demonstrated interest in the academic achievement of students	4.83	4.88	4.83	4.42	4.59	4.6	4.59	4.57
5. The instructor demonstrated and maintained respectful & civil behavior.	4.85	4.91	4.89	4.83	4.87	4.74	4.75	4.83
6. The instructor presented the material clearly and gave understandable explanations	4.7	4.88	4.74	4.83	4.82	4.71	4.68	4.72
7. The instructor was available, whether in person, via phone, email or online, to clarify issues	4.97	4.91	4.74	4.75	4.77	4.48	4.62	4.77
8. Time spent in course activities was related to the subject matter of the course	4.8	4.91	4.75	4.84	4.87	4.81	4.63	4.84
9. Test results and assignments were returned within a reasonable length of time	4.78	4.85	4.74	4.46	4.9	4.78	4.75	4.8
10. The instructor set high standards and encouraged the students to meet with them	4.83	4.9	4.74	4.46	4.64	4.4	4.51	4.66
Which of the following most closely reflects your judgement about the quality of instruction you have received in this course? 5=excellent 1=poor	**4.73**	**4.83**	**4.77**	**4.65**	**4.72**	**4.53**	**4.64**	**4.58**

5. Direct Documentation of Student Learning:

Since the department does not keep records of students' exit exam scores or GRE scores, I am unable to provide direct documentation of student learning. However, since the majority of my students have been accepted into graduate and professional programs, or working with state and private industry, I would like to consider this a form of direct documentation of student learning.

6. Evidence of "Teaching" Outside the Traditional Classroom Setting:

In this last section I would like to touch on my interactions with students outside the traditional classroom. As I mentioned previously, I consider my activities with students an integral part of my teaching. In addition to teaching a full load and advising students with their research projects, I have been involved with many activities related to student interaction outside the classroom. I have also listed some activities that are indirectly related to student learning outside the traditional classroom setting.

I have been advisor to the *Beta Beta Beta* Biological Honor Society and Biology Club for the past eight years. The club is actively involved in a variety of campus, departmental and community events. The club conducts at least two charitable events each year, is actively involved in volunteer work with environmental groups, offers free tutoring to students enrolled in Introductory Biology courses, has hosted a regional *Beta Beta Beta* / Association of Southeastern Association (ASB) meeting, has helped organize two regional and national conferences held at AASU, and participates in many field trips. As advisor I have also organized field trips for students including visits to Savannah River Site and to colleges with graduate or medical programs.

I am actively involved in advising students in the Biology Department. I also participate in CHAOS sessions (orientation sessions for incoming freshmen) and recruiting students to Armstrong.

I have served or am currently serving on university committees that directly or indirectly deal with students. Most notably are the Committee on Instructional Work Group for Student Success Initiatives, Honors Advisory Committee, Arts and Science Curriculum Committee, Leadership Task Force and the Hallmark Advisory Committee.

I am actively involved in PRISM and have presented several PRISM related lectures and workshops. I have also offered summer workshops for high school teachers (MAGNET program) and have participated in several Eisenhower sponsored grants (Science Issues and Technology Workshop for 7 -12 Science Teachers). Although these activities do not directly involve students, these teachers will use the information provided to help teach and educate their own students.

I am on the organizing committee for SOTAB (State of the Art in Biology), a faculty development program developed by the Academic Advisory Committee, Biological Sciences, of the University System of Georgia. This program is geared towards higher ed biology faculty with the intent of providing the most recent and up-to-date information on "state-of-the-art" topics in biology. The hope is that faculty will use and incorporate this information into their curricula, thus enhancing student learning.