

2012-13 Annual Program Plan

Name of Program: Biological Sciences
Name of Unit: Academic Programs
Name of Area: Academic Affairs
Date Completed: 7/31/2012

Program's Mission Statement

The Mission of the Biological Sciences Department is to offer quality educational opportunities for students by providing courses that transfer to four-year institutions, offer associate degrees and certificate courses that meet general education requirements. Maintaining optimal academic standards, ensuring availability of academic & student support services, providing facilities to support teaching and learning, and supporting professional development for faculty are vital to our mission. Our mission supports the Strategic Initiatives (S.I.) of the College:

- Enhance teaching to support student learning using a variety of instructional methods and services. (S.I.-A)
- Strengthen quality educational and support services to promote student success. (S.I.-B)
- Foster a positive learning environment and sense of community and cooperation through an effective process of collaboration and collegial consultation. (S.I.-C)
- Develop and enhance partnerships with schools, colleges, universities, businesses, and community-based organizations to respond to the workforce training and economic development needs of the community. (S.I.-D)
- Improve processes, programs, and services through the effective use of assessment, program review, planning, and resource allocation. (S.I.-E)
- Support facility and technology improvements to meet the needs of students, employees and the community. (S.I.-F)
- Promote processes and policies that move the College toward sustainable, environmentally

sensitive practices. (S.I.-G)

Overarching Outcomes

The outcomes expected from students completing the Biological Sciences curriculum include:

- a) Content knowledge as evidenced by assessments of the conceptual knowledge of course content.
- b) Technical abilities and appropriate use of scientific equipment to complement content knowledge and solidify concepts and ideas.
- c) Proficiency in expressing scientific content in the written form.
- d) Ability to apply the scientific method and to use equipment specific to concentration area.
- e) Improved confidence and student attitudes toward Biological Sciences.

Program's Characteristics, Outcomes, and Trends

The Biological Sciences Department fulfills three educational roles for students – providing general education options for non-majors, lower division courses for majors and preparing students for entry into the nursing program. The non-major biology enrollment will remain steady and even has the potential of expansion as the student population grows since most general education patterns require life science courses. The Health Sciences area is expected to expand to meet the needs of a growing demand for health care professionals. Curriculum will be fairly stable as it represents the lower division requirements of biological sciences majors and general education.

The hiring of two new full-time instructors adds depth to our instructional delivery.

ANATOMY

FTES	FALL 2006	FALL 2007	FALL 2008	SPR 2007	SPR 2008	SPR 2009
Resident	53.36	69.51	87.93	56.21	84.25	112.58
Nonresident	2.00	0.85	1.69	2.30	2.01	2.54
TOTAL FTES	55.36	70.36	89.62	58.51	86.26	115.12
	FALL	FALL	FALL	SPR	SPR	

	2009	2010	2011	2010	2011
SUCCESS RATE	63.5%	55.1%	52.8%	60.2%	57.9%

RETENTION RATE	73.2%	67.0%	71.6%	71.9%	72.6%
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BIOLOGY

FTES	FALL 2006	FALL 2007	FALL 2008	SPR 2007	SPR 2008	SPR 2009
Resident	17.41	22.94	31.19	19.33	36.32	36.50
Nonresident	0.85	0.74	1.15	0.84	3.82	0.94
TOTAL FTES	18.26	23.68	32.34	20.17	40.14	37.44

	FALL 2009	FALL 2010	FALL 2011	SPR 2010	SPR 2011
SUCCESS RATE	63.9%	36.9%	22.5%	48.7%	53.4%

RETENTION RATE	72.7%	49.5%	42.9%	55.9%	68.4%
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MICROBIOLOGY

FTES	FALL 2006	FALL 2007	FALL 2008	SPR 2007	SPR 2008	SPR 2009
Resident	15.29	16.88	16.24	15.61	16.25	31.51
Nonresident	0.64	0.00	0.31	0.64	0.32	1.25
TOTAL FTES	15.93	16.88	16.55	16.25	16.57	32.76

	FALL 2009	FALL 2010	FALL 2011	SPR 2010	SPR 2011
SUCCESS RATE	70.6%	78.1%	81.7%	78.8%	69.0%
RETENTION RATE	82.4%	82.5%	87.3%	84.7%	79.3%

PHYSIOLOGY

FTES	FALL 2006	FALL 2007	FALL 2008	SPR 2007	SPR 2008	SPR 2009
Resident	21.36	21.94	30.22	23.09	26.21	29.32
Nonresident	1.44	0.87	0.85	0.29	0.29	1.13
TOTAL FTES	22.80	22.81	31.07	23.38	26.50	30.45

	FALL 2009	FALL 2010	FALL 2011	SPR 2010	SPR 2011
SUCCESS RATE	66.8%	71.0%	73.4%	72.9%	51.5%
RETENTION RATE	74.5%	78.4%	79.9%	79.4%	62.0%

Program's Strengths and Weaknesses

The Biological Sciences Department has a number of strengths. The curriculum in the discipline is diverse and current. The courses have recently undergone curriculum revisions to reflect current trends in the field of biological sciences. In addition, non-majors biology have a large selection of courses from which to choose in order to earn life science credit. The faculty

and students of the Biological Sciences program are involved in campus-wide activities. The department is growing with increased high quality students who hunger for quality education. The department has six fulltime and seven part time instructors who are dedicated and very committed to the department. The department provides courses for students going into nursing schools, universities, and other career options.

Program's Opportunities and Challenges

The growth of the department requires new equipment and facilities, including labs. The lack of enough lab space has placed a limit on the number of courses that can be offered. Unfortunately, funding is not commensurate with the growth we are experiencing.

The continued shift toward the molecular study of biology necessitates a commitment by the division to invest in the type of equipment and technology that is needed to teach with this perspective. Gel electrophoresis, DNA extraction and restriction digestion of DNA, polymerase chain reaction, and genetic recombination have become classroom staples on other campuses. A growing portion of the program budget must be devoted to the supplies needed to perform these techniques each semester. Failure to do so could compromise the articulation agreements that our program has with the local universities and further compromise our students competitive edge.

The cost of dissection specimens such as frogs, fetal pigs, different organs and cats has become prohibitive. The program budget can no longer absorb the cost of buying and disposing these specimens at the volume of past years. Increased costs of dissection specimens will affect the ability to obtain supplies and equipment for the study of biological sciences.

English, reading and writing prerequisites for targeted courses need to be established to increase student success.

General biology should be a prerequisite or at least a recommended course for Anatomy-32, Physiology-31 and Microbiology-33.

Evaluation of Program's Performance

Preliminary data indicate improvements in success and retention rates of students. We believe this is a reflection of the caliber and dedication of our faculty. We endeavor to prepare our students for success in life and in their professions. Our graduates go on to higher levels of study and have been very successful. Several enter the nursing program. Review of SLOs, success, retention and transfer rates will be ongoing, alongside examination of post department success.

Program's 3-5 Year Strategic Directions

Additional labs need to be acquired. MS 128 is currently being used as additional lab. Two new full-time faculty members and a lab assistant were recently hired to replace a recent lab technician retirement. We propose to introduce molecular biology, principles of biology, human genetics, and Anatomy and Physiology I and II to broaden our course offerings for both biology majors and allied health students. These are courses that are in high demand and will help to increase enrollment and FTES. For the first time, we are offering Anatomy-32 as a hybrid course and more hybrid courses could be offered in Biological Sciences.

Goal #1 Long term (2-5 years) Status: in progress

11/11/12: Overall our success and retention rates are improving. The numbers for 2012 are better than the corresponding 2011 numbers as shown above.

06/12/13: We continued to work hard to enhance our students' success and retention rates. Faculty reflected on teaching and student achievement through the semester. We also shared teaching techniques and resources to improve student learning.

Strengthen quality educational and support services to promote student success. (S.I.-B)

Evaluation of Goal

By the end of 2012/13 year:

1. There will be a 5% increase in the number of students successfully completing courses in the biological sciences over the 2011/12 rates.
2. There will be a 5% increase in the retention rates of students taking Biological Sciences courses over the 2011/12 rates.

Objective #1.1 Status: in progress

11/11/12: The delivery of instruction in our classes is better than the previous year. We use interactive clicker response system to engage our students and collect data for reflection. Our lab activities are enhanced with new biopac equipment and specs. We hope the budget situation improves and we are able to afford more resources and develop new courses like molecular biology.

06/12/13: Teaching and learning improved through the year. Our lab resources/equipment were put to optimum use. Students' morale was high. Microbiology lab gas supply still needs to be fixed. Lecture and lab space remains an issue

limiting our growth.

Upgrade laboratory equipment and increase lab space to introduce principles of biology, molecular biology, and up to date experiments in biological sciences.

Students will acquire in depth quality education by participating in both lecture and lab activities. We have recently purchased seven (7) sets of biopac equipment and laptops for our physiology classes. We have five (5) sets of clicker response system to be served by the professors in each classroom. More anatomy lab models and good histology slides are to be purchased.

Equipment upgrades will include the purchase of Southern blot and Western blot apparatuses, a PCR machine and a microscope with fluorescence capabilities and a computer and software package for image capture and storage.

We are still handicapped by the budget shortfall and limited lab space to introduce courses like molecular biology or biotechnology. Equipment costs are in the hundreds of thousands. Interested faculty members are looking at funding opportunities through non-governmental agencies. Limited lab space is still also a big issue. Currently, we use one room for three different lab setups.

Projection microscopes will allow the instructors to demonstrate the histological and biological material in an efficient and time saving manner and for easy group review and discussion of such materials. All microscopes should be retro fitted with a pointer in ocular lens.

Routine SLO assessments will provide a measure of the high quality education towards achieving higher success and retention rates.

2011/12 PR #3, 11, 15-18

Resources Needed: Additional Personnel

Position Classification: Classified Staff

Required for How Long: Ongoing

Position Description:

Lab Assistant

Estimated Cost: \$ 50000

Supporting Rationale:

To help with the lab preparation, ordering, and management of lab materials as we diversify our course offerings.

Resources Needed: Additional Budget

Object Code: 6400 EQUIPMENT

Required for How Long: 2 years

Requested Amount: \$ 200000

Description:

Southern blot and Western blot apparatuses, a PCR machine and a microscope with fluorescence capabilities and a computer and software package for image capture and storage. A class room set of new microscopes

- Nikon E200 (used for micro and anatomy) - \$1,346.00 each (from www.opticsplanet.net)
 - o Set of 20 = \$26,920.00
 - o Set of 36 = \$48,456.00
- Wolfe CFL scopes (similar to the older ones used for Biology) are available from Carolina for \$485.00 each
 - o Set of 36 = \$17,460
- 2. Upgrades for our classroom equipment, models, and slides.
 - Equipment (primarily microscopes and autoclave)
 - o \$1887.44 in microscope repair and parts (repair completed, parts quoted/in progress)
 - o \$640 autoclave repair (PO in progress)
 - o \$6,500 autoclave service contract (PO in progress)
 - o ~\$1108 in microscope parts, lab chemicals and dyes still need to be ordered
 - o Comprehensive medical histology slide set of 20-\$11,000
 - Models (from Ward's, Carolina, and American 3B Scientific)
 - o For 2 classrooms: \$19,684.65
 - o For 3 classrooms: \$35,025.45
 - Slides
 - o Set of 30 of each slide (1 class set) - \$16,480.62
 - o Set of 60 of each slide (2 class sets) - \$20,499.62
- 3. A classroom set of computers (instructors and students) – 40 computers
 - HP SmartBuy (\$349-549 each) - \$13,960-\$21,960
 - Dell Inspirion 560 (\$499 each) - \$19,960
- 4. Two new labs.
 - \$40000 for two prefab labs or \$20000 if an old structure is converted into labs
- 5. Additional laboratory assistance by availability of funds

Supporting Rationale

The introduction of molecular biology laboratory experiences is crucial for currency in the field.

Providing good quality slides and excellent working microscopes, so that the students can have a better understanding of the structure of tissues and organs, as well as biological specimens.

Computer technology is crucial to remain current in the field.

Additional laboratory assistant to reduce the load of activities carried through the years and increase effectiveness if other rooms are converted to labs.

Objective #1.2

Status: in progress

11/11/12: Most of our textbooks now provide students and professors with different resources to help their study and presentation. These add more to the cost for students. Providing these textbooks and other resources in our labs will help our students greatly.

06/12/13: We now have most of our textbook/manual bundled with several learning materials at relatively cheaper prices. We are following the discussion on licensing from publishers so that students can use the resources in our labs.

Purchase and implement in Biology and Physiology courses, multimedia support tools and resources for faculty and students, such as Agile Mind Biology and the Ph.I.L.S. program.

The publishers market their multimedia resources through individual text/online purchases. Unfortunately not all students can afford this. Therefore, not only in Biology and Physiology, but for every one of our courses should the department be funded this year to acquire resources for our labs and every student can benefit from it.

2011/12 PR #11

Resources Needed: Additional Budget

Object Code: 5100 PERSONAL AND CONSULTANT SERVICES

Required for How Long: Ongoing

Requested Amount: \$ 10000

Description:

The Agile Minds Biology and PhILS require a contract for services to the faculty member, students and institution for access to course support tools, resources and strategies.

Supporting Rationale

Agile Minds and PhILS will provide access to programs, simulations, training and data support to improve and evaluate student performance.

Objective #1.3

Status: in progress

11/11/12: The Learning Resource Center is assisting with tutors and a few of the tutors now work with our students in our building. We hope this will be continued and expanded.

06/12/13: Tutors and Supplemental Instructors were available for a few of our sections in the last semester. We are working with the LRC to document the impact on our learning and retention, and also to expand the program. We hope to start open labs and weekend access to the computer lab in the next semester.

Hire tutors and supplemental instruction coaches for all levels of biological science classes to

tutor in the science labs.

Tutoring and supplemental instruction, as vital as they are for the success of our students are almost non-existent. Only one supplemental instructor is currently available for Biology and no tutors or SI for the other courses. A number of professors are volunteering their office hours to tutor but this is a far cry from what we need to provide the support for our student.

Open lab is also needed to give time to our students to catch up on their studies.

Convert MS 105 as a "Biological Sciences Resource Center", which could be used for instructor led/supervised reviews for labs and "Open House" office hours. It's easier and safe to get models, slides, and dissected specimens for reviews within the confines of the Biological Sciences Department.

Weekend access to computer and biological sciences labs will go a long way to serve our students and improve success rates.

2011/12 PR #10, 11

Impact of Objective on Other Programs, Units, and/or Areas

Impact on the Area: Academic Affairs

Impact on the Learning Resource Center:

The Learning Resource Center would need to be involved in the recruitment, hiring and scheduling of additional biology tutors. We need additional supplemental instructional coaches for the program since one is not sufficient.

Existing Resources

MS 105 is a small room, most suited for in-house tutoring. Easily accessible by both students and Faculty. No monetary expenditure required, as microscopes, models, slides and dissected or preserved specimens from Bio-10, Anatomy-32 and Micro-33 labs could be used. The room is already equipped with AV equipment and has internet access.

Resources Needed: Additional Space or Changes to Facilities

Requested Amount: \$ 0

Description:

Open labs

Faculty led/supervised reviews to provide more access for students to lab materials for better learning outcomes.

Reason:

Providing additional lab time and materials will help to improve student retention, success and over all learning outcomes.

Location: MS 105 in Math & Science Building

Services Required: None

Objective #1.4

Status: in progress

11/11/12: Many of the faculty use clickers in the classroom and are reporting improved participation from students.

06/12/13: Lectures have been enhanced as instructors could follow student progress and clarify/reinforce concepts.

Incorporate the use of the available five sets of clickers and receivers into lectures in each classroom/lab in the biological science areas.

With the available clickers, students are responding with greater participation and learning.

2011/12 PR #11

Existing Resources

TurningPoint Clickers available in prep room to be checked out from lab assistant.

Objective #1.5

Status: in progress

11/11/12: Our lab assistant is supporting the faculty.

06/12/13: The new lab assistant transitioned into our program well. The additional part time lab assistant is also supporting evening faculty.

Support instructors by providing necessary materials in addition to keeping the technology and equipment in labs safe and accessible to instructors.

2011/12 PR #20

Resources Needed: Additional Personnel

Position Classification: Classified Staff

Required for How Long: Ongoing

Position Description:

Additional lab assistant to help with running of the labs.

Estimated Cost: \$ 50000

Supporting Rationale:

Our lab load is increasing as we expand and diversify our course offerings. Hiring an additional lab assistant increases effectiveness and share the load of the existing technician. The increase in the number of lab sections needs additional personnel for the efficient running of the labs in the department.

Goal #2 Long term (2-5 years) Status: in progress
06/12/13: Instructors introduced more interactive activities and many used the clicker system to monitor learning.

Enhance teaching to support student learning using a variety of instructional methods and services. (S.I.-A)

Evaluation of Goal

From the 2012/13 year:
Professors in Biological Sciences will incorporate at least one new teaching method (for example, cooperative and inquiry based learning) in addition to direct instruction

At the beginning of 2013/14:
Offer one hybrid courses in anatomy, physiology and biology.

The jigsaw procedure could be implemented regularly to increase the success and retention rates.

Our professors are very knowledgeable in the field of biological sciences. They incorporate technology in to their teaching and classroom activities. Several professors are Etudes certified and are ready to provide hybrid/online courses.

Objective #2.1 Status: in progress

11/11/12: We are still limited in space and funding to start any new course or additional sections.
06/12/13: The ongoing discussion about reducing Anat 30 sections may offer the opportunity to add Physiology34A and 34B to our offerings. We hope that future funding will improve and we can acquire new classrooms and labs.

Offer Anat 34A and 34B and Biol 101 and 102 as new course offering
Offer hybrid courses: Anat 30, Anat 32, Biol 10, Biol 15
Acquire two new labs for the program

2011/12 PR # 20
2011/12 PR # 14

Resources Needed: Additional Space or Changes to Facilities

Requested Amount: \$ 40000

Description:

additional lab space needed

Reason:

Operate additional life science labs

Location: Remodel facility next to math/science building

Services Required: None

Goal #3 Long term (2-5 years) Status: in progress

11/11/12: The climate in the building is still an issue. Multimedia resources are working in the classrooms.

06/12/13: The climate in the building is still an issue. It is either too hot or too cold. Upgrade of the projection equipment is desirable.

Support facility and technology improvements to meet the needs of students, employees and the community. (S.I.-F)

Evaluation of Goal

From the begininng of Fall 2012/13

1. Each classroom will have a working projector/screen, multimedia players, and internet access in the labs.
2. The climate in the MS building will be regulated.

Each classroom has some set up for projection but not all has internet access. MS 103 and 107 connections are not accessible. Easy access to internet is an essential support for teaching and learning. The MIS is trying to support but we need the maintainance and upgrade of the projection setup to be more frequent.

A few of the projection equipment do not have CD players, video and audio components. Ceiling mounted projectors are a better option to avoid theft and ensure correct optics.

It is hoped that the climate in the MS building will be controlled appropriately. The conditions in the building during the winter and summer 2012 semesters were extreme. Temperatures in MS 108 approached 90 degrees with doors open and fans on. It was very uncomfortable for everyone. This is a serious health hazard and it will definitely affect our success as well as retention rates.

Objective #3.1

Status: in progress

06/12/13: We have to carry laptops back and forth. Modern projection systems will have functional CD drives and require only memory stick. This will actually reduce the breakdown of the systems that experience so often. There is no projection system in the physics/astronomy lab, MS 130. We need a set in the room.

Upgrade multimedia equipment with better features, provide projectors on carts (as stand by in case of malfunction) and regularly adjust classroom projector screens

Ceiling mounted projectors are a better option to avoid theft and hassle of getting them around on weekends and evening classes when techs are not there.

2011/12 PR #1

Resources Needed: Additional Budget

Object Code: 4000 SUPPLIES AND MATERIALS

Required for How Long: 1 time

Requested Amount: \$ 5000

Description:

Buy projectors and carts for the labs

Supporting Rationale

Students can view power point presentations and computer software. Projector screens in the classrooms need to fit the projector image screen. This should be constantly monitored and the projectors adjusted accordingly.

Objective #3.2

Status: in progress

11/11/12: Internet access is available in the class rooms and labs.

06/12/13: MS 103 and 107 do not have internet access and many rooms do not have audio function.

Provide internet access in each classroom and lab.

2011/12 PR #8

Resources Needed: Additional Budget

Object Code: 4000 SUPPLIES AND MATERIALS

Required for How Long: 1 time

Requested Amount: \$ 3000

Description:

Provide at least wired internet access in each classroom

Supporting Rationale

Instructors often include the web as part of their presentation. Internet access in this day and age is essential. Of course the ideal would be to provide wireless access to the internet anywhere at the Center.

Objective #3.3

Status: in progress

11/11/12: Our students now have access to the computer lab, including weekends. We hope this will be extended to open labs so the students can use models and microscope at times other than class times.

06/12/13: Weekend access to computer lab is off and on. We would prefer a permanent situation which can also be extended to open labs.

Provide student access to the labs on weekends

2011/12 PR #10

Existing Resources

Students can use existing lab materials/computers on the weekends if the labs are open, providing familiarity with the equipment and technology (S.I.-B)

Goal #4 Short term (1 year)

Status: being changed

06/12/13: We support construction efforts on the campus.

Promote processes and policies that move the College toward sustainable environmentally sensitive practices. (S.I.-G)

Evaluation of Goal

By the beginning of 2012/13 year:

Chalk board will be replaced with white boards and the use of chalk discontinued.

Chalk powder clogs the filter and this interferes with the functioning of the cooling/heating system, as well as sensitive microscopes and science equipment. The chalk dust is a health hazard for the students and instructors. The HVAC system provides no adequate air movement or filtration in the Math/Science building.

Objective #4.1

Status: in progress

11/11/12: We still have chalk boards.

06/12/13: We hope the chalk boards are replaced with white boards soonest.

Replace chalkboards with whiteboards throughout the math/science building.

2011/12 PR #8

Resources Needed: Additional Budget

Object Code: 4000 SUPPLIES AND MATERIALS

Required for How Long: 5 years

Requested Amount: \$ 5000

Description:

Replace chalkboard with whiteboard

Supporting Rationale

This is better for the people and environment. The chalk damages our HVAC system, leading to frequent breakdowns as the chalk clogs the filters in the building. Chalk dust is also a health hazard for the students and instructors.

Appendix A

Appendix B

Individuals Who Participated in Developing this Plan

The following people acknowledge that they participated in the development of or reviewed this plan.

Name	Role
1. Osanyinpeju, Abiodun	Plan Leader
2. Murray, Rodney	Reviewer
3. Roach, Donald	Participant
4. AASI, FAZAL	Reviewer
5. Priest, Michelle	Reviewer
6. Wallano, Eyob	Reviewer