Biology Department: Weber Stage 2 Application

I. Statement of Departmental Philosophy of Teaching and Learning

Biology instruction allows for and indeed requires a wide range of pedagogical approaches. The field itself spans spatial and conceptual scales from the molecular borders of biochemistry through the anatomical details of individual organisms up to modeling at the ecosystem or biome scale. With such a range of content areas, no single educational approach would suffice. Therefore, one important aspect of the Biology Department's teaching philosophy is the pedagogical autonomy of each faculty member, who must each take ownership of ensuring that students have opportunities for critical thinking while constructing a framework for understanding complex concepts that will be built upon in subsequent courses. Another important facet of the Department's teaching philosophy is represented in its policy regarding credentials of instructors. The Department has a requirement that courses for majors must be taught by instructors holding a PhD or equivalent. Faculty holding the PhD also teach most Department courses for non-majors. Finally, the faculty collectively agree that one of the most effective pathways to really understanding science (experimental design, techniques, data analysis, concepts) is to "do science", that is, to participate in hands-on inquiry through laboratory courses and independent research.

Critical Thinking. The faculty have discussed the Paul-Elder model of instruction in critical thinking, and in fact one of Biology faculty member, Dr. Cynthia Corbitt, participated in an Paul-Elder workshop in California with other U of L faculty sent to determine whether U of L would adopt this model university wide. Through faculty discussions of the model, it was realized that as scientists, we already incorporate many aspects of the model in our approach to research and teaching. Focusing on the "Scientific Method" (i.e., using observations to formulate testable hypotheses that can be supported or refuted with gathered evidence, being willing to reject favored hypotheses if said evidence refutes them, modifying and retesting hypotheses), fits within the Paul-Elder framework even if the jargon sometimes differs. Pointing out how the jargon of scientific process relates to that of Paul-Elder helps students realize that critical thinking is critical thinking, regardless of the field. Particular approaches to encourage development of critical thinking skills vary by course and instructor, but some examples include assessing current peer-reviewed literature (What is the claim? Do the data support the claim?), playing detective to unravel medical case studies, and analyzing a mass media report of a scientific finding in comparison to the source material (Is it clearly presented and accurate? Is it sensationalized?).

Core Curriculum Design. The rich details of advanced biology courses are incomprehensible without foundational material, meaning that a planned multi-semester sequence of instruction is essential and, therefore, built into the Biology core curriculum. Instructors in the introductory courses for majors (Biology 240, 242, 244) often make specific lecture reference to topics for future elaboration in later required courses. Faculty in charge of 300-level core courses (329 Cell and Molecular Biology, 330 Genetics, and 363 Ecology) likewise point out to students both back-connections to the introductory courses and opportunities for more advanced study in elective courses. By the time students finish the two year core curriculum, many of the foundational concepts (e.g., cell theory, protein synthesis, natural selection) are established, much like a frame of a new building, such that upper-level specialized courses have a structure on which to add complexity: the bricks, façade and interior design, if you will. Instructors of upper-level courses revisit basic concepts before delving into complexity. Prerequisites are in place to assure that students have the necessary background before attempting courses that assume familiarity with it.

Hands-on inquiry. All Biology majors are required to complete at least two laboratory courses (Biol 244, 331) as part of the core curriculum and most complete additional upper-level lab courses (e.g., Biol 400, Histology, always has a wait list). Laboratory courses provide

students with the opportunity to experience the discipline through the lab exercises and in addition practice the experimental aspects of the field. This practice involves developing peer communication skills, learning specialized laboratory techniques, writing results of their lab experiments, and put to practice the scientific method. Most Department faculty members have regularly mentored undergraduates in independent research, in part because it is the most effective way to make science "real" for students. Over the past nine academic semesters, 208 students have registered for independent research credit in Biology (e.g., Biol 404, 406-WR). Many of these students have completed senior honors theses. In an effort to help students find undergraduate research opportunities, the Department started a seminar course in 2004 (Biol 388) that introduces Biology majors to faculty who wish to recruit undergraduate researchers. Over the past nine academic semesters in which the course was offered, 72 students registered and most of those went on to do independent research in labs on the Belknap or HSC campuses. Educational experiences like these help provide the program of study enrichment that will lead to increased student persistence in STEM fields.

Non-majors instruction. The instruction of non-majors in the concepts of biological science serves an essential role for the university and for the community at large. It is the philosophy of the Biology Department faculty that every educated person should be scientifically literate. Regardless of whether a given person remembers the details of DNA replication or metabolism, every educated member of society should be able to critically assess mass media reports of new technologies involving genetic modification or public health initiatives regarding diabetes or obesity, for example. They should also be armed with an ability to ferret out or at least question pseudo-science and false scientific claims. Non-majors courses (Biol 102, 257, 258, 260, 261, 262 and 263) aim to provide students with the background knowledge and tools of scientific literacy. The Paul-Elder framework for critical thinking referenced earlier is also of value in building this scientific literacy. The framework encourages students to separate fact claims from the definitions of concepts and categories used to express those fact claims. If students respond to a report about diabetes or obesity by asking themselves how those conditions were defined for the purpose of the study, the framework has improved their ability to consider new information.

Graduate Instruction. The Biology Department also provides instruction for both the MS and PhD degrees. In both of these degree programs the emphasis is on research and the refinement of techniques, analyses, and critical thinking in the chosen area of concentration. Concentration areas are broadly divided into two major divisions, Ecology, Evolution and Behavioral Biology (EEB) and Molecular, Cellular and Developmental Biology (MCD). Students graduating from the graduate program will have developed a greater independence in the ability to understand major Biological concepts in the areas of cell structure & function, genetics, evolution and the relationships among organisms, organismal structure & function and ecology. The emphasis in graduate course material is to learn to think critically and learn independently, communicate professionally with science peers and understand and use scientific analytical tools both in laboratory and fieldwork. Students must also appreciate and practice the varied perspectives and personal responsibilities within the human community, including stewardship, ethics and diversity. The Department's graduate programs also involve developing the ability to help others learn in both the classroom as a graduate teaching assistant and in the research lab as a graduate student mentor to undergraduates assisting with research projects.

Science Education Research. Lastly, the Department has always considered its role in the education of students one of the most significant contributions it can make to the University. Given that the Biology Department is one of the largest undergraduate and graduate departments at the University of Louisville, the education mission of the Department is a significant one. The Department instructs more than 9000 students enroll in its classes each academic year, with 40 percent of these students taking Biology general education classes. With more than 400 approved undergraduate majors with another 400 intended majors, maintaining state of the art instructional

technologies is important. In addition, there are more than 50 graduate students in Biology seeking advanced degrees. Given the significance of national discussions revolving around higher education reform, it is important to stay informed about ongoing research in science/higher education. Members of the Biology Department have actively participated in a variety of educational initiatives including the University's Ideas to Action plan, part of the quality enhancement plan (QEP) developed as part of the SACS reaccreditation process, the Degree Qualifications Profile (DQP), a postsecondary learning outcomes framework that specifies what students should be expected to know and be able to do at the associate's, bachelor's, and master's levels, and the Council on Postsecondary Education's initiative "Tuning Kentucky". Most recently, several faculty members participated in the 2014 Gulf Coast Summer Institute focused on scientific teaching, active learning assessment, and diversity. They will present their experiences in this institute at a Department faculty meeting with members of the Weber review committee in early December. In order to develop more awareness of the importance of science education the faculty decided to fill an open tenure track faculty lines with a Biologist conducting research in the area of science education. Dr. Linda Fuselier joined the Department in Fall 2014 and will initially be in charge of the general education Biology 102/104 sections as well as enhance the Department's efforts at forming a collaborating and more formal bridge with the College of Education and Human Development.

One attachment to this document is the most recent student opinion survey conducted by the University office of Institutional Research. Pages 15-23 are specific to the Biology department and may be compared to the College of Arts & Sciences student opinions expressed in the first 15 pages. This survey supports the Department's accomplishments at helping its students develop their critical thinking skills, oral and written expression opportunities and the general feeling toward the Department.

Section II. Describe the approaches used by the department to address the award selection criteria

i. Commitment to exemplary teaching over time:

Teaching experience and philosophy of teaching have long been important factors in hiring decisions for new Biology faculty members. For the past 15+ years, every faculty applicant for a position in Biology has been required to submit a statement teaching interest. Biology faculty evaluate these teaching statements and take them serious when choosing the best candidates for an open faculty line. The Department has a significant student population to serve and all members of the Department must contribute and provide the highest quality educational experience. As a natural science department with a research mission, faculty are all involved in bringing their own research experiences or those of colleagues from around the world into their classrooms and exposing the students to new research findings. This provides students with many different opportunities to apply content knowledge and critical thinking skills to the discipline. The five year annual percentage of time devoted to teaching activities recorded on Department faculty annual work plans (AWPs), has averaged 55%k compared to 34% time allotted for research.

Many faculty in Biology have used Delphi center programs to strengthen their teaching styles and learn new ways to present material to their students. Dr. Ronald Fell served on the initial Ideas to Action (I2A) committee as the representative from the College of Arts & Sciences. Since the development of I2A as part of the University's Quality Enhancement Plan (QEP) proposed in the SACS report, over half of the Department faculty have participated in one or more Delphi Center sponsored training programs. Several examples of the Department's dedication to exemplary teaching was in the hiring of Dr. Mark Running. Dr. Running made it clear in his interview that he wanted to leave a research institute position so he would have more opportunities to teach undergraduates. This was a major deciding factor in offering him the position over other candidates who were well qualified in research but did not show the same dedication to teaching. He has taken on core curriculum (Biol 329) and writing intensive (Biol 348-WR) courses, mentored over 20 undergraduate researchers in his lab, and successfully procured highly competitive National Science Foundation funding for a paid summer research program for undergraduates (NSF REU). Another example of Department dedication to teaching is the recent hiring of Dr. Linda Fuselier, whose research involves Biology education. Dr. Fuselier has a new research project in collaboration with Dr. Jennifer Mansfield-Jones, and in her first semester at U of L has obtained a small grant to do curriculum revisement in Biology 104, a general education lab course and in the Anatomy and Physiology 262 lab. In addition, Dr. Fuselier is working with one of the U of L research librarians, Robert Detmering and his group of assistants to develop a science information literacy lesson for the Biology 104 labs. The lessons will be online and in-class and will be based on the autism and vaccines “controversy”. Drs Joe Steffen and Mark Running attended the 2014 Gulf Coast Summer Institute focused on scientific teaching, active learning assessment, and diversity. They returned from the meeting and set in motion plans to initiate new ways of presenting and discussing material in their individual classes. Their classes already use methods for enhancing student critical thinking skills and develop communication skills. They will discuss this Institute experience with the faculty and the Weber Committee at a faculty meeting in December.

Above are just a few examples of the types of commitment Biology faculty have made to enhance the learning experiences of students both in the major and in general education classes taught in the Department. Others are discussed briefly in following sections.

ii. Commitment to development for teaching:

The Department's commitment to teaching development is seen with both its faculty and its graduate students. Faculty have been encouraged to attend Delphi Center sponsored

training workshops and participate in faculty learning communities and many have taken advantage of these opportunities. Department funds have been committed to send faculty to teaching institutes and workshops. Another important aspect of delivering the Biology curriculum is the high degree of dedication provided by the Department Graduate Teaching Assistants (GTA). They learn during an orientation meeting the first semester they join the Department that as a GTA, they have a close, more individualized contact with undergraduate students in their smaller laboratory sections. Because of the high student demand for biology classes, lecture class size is above optimal and lab GTAs get to know many students better then the faculty member in charge of a class. Because of this close contact, GTAs must be dedicated to enhancing the undergraduate educational experience and work with the faculty member to make sure the highest quality of instruction is provided. Graduate students have always been encouraged and have participated in the GTA Academy and PLAN workshops or other training opportunities available through SIGS. A specific example of such participation was when Dr. Cynthia Corbitt and Monica Unseld (graduated with a PhD in 2008 attended the Carnegie Initiative on the Doctorate Convening: Developing Effective Teachers (i.e., training graduate students how to teach) held in Palo Alto, CA, 2005.

The Department has always had openness to helping new faculty improve teaching and encouragement for new faculty to seek assistance (e.g., sit in on lectures of established teachers, seek advice on syllabi or exams, attend Delphi Center events). Over the years Biology faculty have documented attendance and participation in the Celebration of Teaching and Learning workshops each year held on the Shelby Campus, participation in Delphi Center Teaching and Learning programs, i.e., Using Rubrics; Using Blackboard; Assessment, Active Learning Strategies for Lecture-Based Teachers, Everyday Examples of Engineering Concepts, and several have attended the Foundation for Critical Thinking conference in Berkeley CA at the Paul-Elder institute.

Experiences like those mentioned above have benefitted new faculty coming into the Department. Such benefits vary and include receiving advice from more established instructors through sharing course content ideas, exam format thoughts, visiting faculty colleague's classrooms, and in some cases using a team-teaching approach. The concept of team-teaching is one currently being considered by the Department. In a previous semester the Department was faced with the untimely passing of one of its faculty members in charge of a first-year core curriculum course. Five faculty members worked together to team-teach this large introductory course and the results were very positive. Faculty each taught a section of the course aligned most closely with their research interest and expertise. This led to excellent application of content examples being presented to the students in a depth that would otherwise not normally be presented. Because many of Biology majors pursue professional and graduate schools after graduation, this teaching format also allowed them to experience the team taught classroom often used in postgraduate programs. The downside, according to student evaluations, was that they were never able to "get used to one faculty member's style of teaching"! Because the positive comments of this team teaching approach far outweighed the negatives, the Department is considering going to this model for the first year courses (Biology 240 and 242).

iii. Commitment to student success:

Scheduling classes in a large department like Biology is difficult. This Fall 2014 semester the Department had 4619 students registered for its undergraduate and graduate classes. Class scheduling falls under the responsibility of the Chair of the Department, however, faculty continually provide input into this scheduling process and in particular when overlapping conflicts between classes are realized. In many cases by a simple schedule change of 15 minutes in a course offering can eliminate a schedule conflict that would otherwise prevent students from taking another needed class. Faculty have always been very agreeable to

adjusting the time their classes are offered in order to avoid class time conflicts and thus demonstrate a commitment to student success.

As a member of the University's Persistence to Graduation Council, the Department Chair is attentive to Department class schedules and degree requirements. When faculty have left the University, a void naturally occurs in course offerings and may require a modification in the degree programs in order to accommodate course availability and ensure the ability to complete a degree in 4 years. The Department Undergraduate Program Committee is also attentive to such needed modifications and also continually assesses and assists in revising degree programs so as to remove courses no longer offered and to include new options for completion of the degree. All such modifications assist in student success in meeting an appropriate time frame for degree completion and ensure a content responsible program of study.

The Department's commitment to student success goes far beyond just the classroom. Opportunities for internships, community engagement, and research experiences all contribute to student success. Most recently graduate students, Max Adams won first place and Evan Gora won third place in the graduate student oral presentation competition at the Kentucky Academy of Sciences (KAS) meeting in Lexington. A Plant Biology REU student, Chloe Lash, worked in Dr. Steve Yanoviak's laboratory this past summer and won first place in the undergraduate poster competition at the KAS. After the KAS meeting, Max Adams, Sarah Handlon and Dr. Yanoviak attended the Entomological Society of America meeting in Portland. Sarah is an undergraduate working in the Yanoviak lab who received the Stuart Neff award for significant work in Biology in 2014. Max and Sarah gave talks in the student competition there. Although they did not win any awards, both gave outstanding talks, and were excellent ambassadors for the University and the Department.

Several other specific examples of the Department's commitment to student success deserve mentioning. Dr. Deborah Yoder-Himes and colleague Dr. Paul Himes initiated a pilot project with 7 highly motivated undergraduate and postbac students during the 2013-14 academic year that expanded to 17 students in summer 2014. The project was designed to address the problem of where in nature pathogenic antibiotic resistant bacteria live, how they interact with each other, and how people acquire them – all major problems in modern health care. The project was relevant to student interests because many are pre-med/pre-dental students, while others wanted to go to graduate school in microbiology. The students developed hypotheses about what types of environments would be most likely sources of these bacteria, and then helped identify methods that would let them test those hypotheses. Methods and hypotheses were refined with the returning students each acting as a leader of a smaller group in order to gain experience training new students and providing them guidance. At the end of the summer, the groups worked together to compile their data and create reports, which a smaller subset of students then used to make a series of posters to present data at Research! Louisville, the Kentucky Honors Roundtable, and the Kentucky Academy of Sciences meetings. As a whole, the group received guided experience in the scientific process from observation, hypothesis generation, experimental design, data collection and interpretation, hypothesis revision, data collection and interpretation, and data reporting.

Another specific example that demonstrates student commitment involves working with pre-college students. Dr. Susanna Remold developed a collaboration with four public high school teachers working in three schools, including schools serving underrepresented minority students, rural students, and students with few role models who have pursued education past high school. Students conduct ecological surveys of microbes, especially Pseudomonas, in their schools and homes, analyze their data, and visit Dr. Remold's laboratory to participate in molecular identification of the samples they have collected. The goals of the project include exposing students to concepts in ecology, evolution and microbiology, and to scientific skills and thinking emphasized in the Next Generation Science Standards recently adopted in KY. An NSF-funded Research Experience supported two high school teachers involved in the program for a summer

for Teachers Supplement to Dr. Remold's NSF grant. During their summer collaboration these teachers gained first-hand experience in microbial ecology and worked with Dr. Remold on further development of this high school curriculum supplement project. Recently another Biology faculty member, Dr. Shira Rabin, joined the collaboration and has taken on coordinating this continuing project. These faculty members continue to develop and share this curriculum supplement for high school biology classrooms and were able to obtain IRB approval for a study assessing the efficacy of this program in improving a student's understanding of concepts that are key to the Next Generation Sciences Standards. The pilot pre-post study detected significant improvement in skills associated with these standards occurring over the course of time in which the students participated in this program.

Lastly, a continuing demonstration of Biology's commitment to student success is its advising system. Biology has for many years had an advising system unlike most other departments in the University. Biology takes advantage of the formal Program of Study (POS) form that is filled out for each student when they are accepted into the major. This form is sent from the College advising office directly to the Department where the student is assigned a faculty advisor. The student is sent an email from the Department indicating the POS has been received and tells them to schedule an appointment and pick up this form from their advisor. This procedure assures the Department that the student meets with their assigned advisor. Once the student picks up the POS, it serves as their "road map" to degree completion and makes graduation in four years much easier. When the Department gets the POS, the student is added to the Department's internal database and can easily be tracked for progress through the degree program. This record keeping system has proven itself more accurate and much quicker than trying to get individual student data from Institutional Research or directly from the Peoplesoft system. This advising process has been used with great success for the Department's many transfer students as well since this group of students tend not to receive the advising needed to make their transfer successful.

iv. Commitment to exemplary collaboration:

The Department has a number of courses that provide excellent opportunities for students to collaborate with faculty and other students. Biology 388, Biology Honors Seminar, is an introductory course that invites faculty from Arts & Sciences, Medicine, Dentistry, and Public Health who want to recruit undergraduate researchers. The faculty member discusses how they got started in research, why they wanted a research career, and present their specific ongoing research. These presentations often attract undergraduate students to a specific lab and participation in a high impact research experience.

An internship course (Biology 490) developed by Dr. Perri Eason gives students a unique opportunity to apply the content learned in courses at an internship site of their choosing. This was the first course the Department had approved as a culminating undergraduate experience (CUE) course and one that has continued to attract more and more students each year. The internship experiences allow students to collaborate with professionals in their area of interest, apply their classroom content knowledge, and continue to develop both their oral and written communication skills.

Biology faculty have always been very collaborative with each other and with other faculty around the University. Many faculty have associate appointments in other departments including, Physiology, Biochemistry, Microbiology, Anatomy & Neurosciences, and Public Health. It is important for both undergraduate and graduate students to see these collaborations among faculty and realize the importance in today's scientific community that the interdisciplinary nature of science requires such collaborative work.

Lastly, the Department's plan to team-teach the first year major's courses is the ultimate collaborative effort in teaching. With multiple sections of these classes taught each year, there is a great opportunity to compare student performance and student evaluations in

order to determine if this team taught approach may be a more valuable learning experience for the students.

v. Commitment to linking discovery, creative activity, and engagement with teaching and learning:

All Biology faculty are involved with sponsoring or directly supervising undergraduate research. All undergraduate research and independent study student credit hours are documented on the annual faculty merit summary sheets turned into the Department Personnel Committee for merit consideration.

There are several specific course examples that demonstrate the Department link with research and teaching and learning. The Biology 388 Introduction to Research course mentioned earlier was designed to introduce sophomores and rising juniors to research opportunities on the Belknap and HSC campuses. Faculty members give seminars to explain research questions and methodologies used their laboratories, opening the door for students to approach them if interested in doing research in their labs. This course also introduces students to paid summer research opportunities (e.g., SROP, Biology REU), guidelines for completion of a senior honors thesis, principles of bioethics, and methods for effective online literature searches and citation management (EndNote). Most students in this course go on to engage in undergraduate research and many complete a senior honors thesis. Biology often has more students than any other department completing such an honors thesis.

Course credit for independent research (Biology 404, 405, 406-WR), counts toward both the B.A. and B.S. degrees. There are established procedures set by a common syllabus for research work used for academic credit and such projects can be done with faculty in the Department as well as faculty in other Departments if the research is Biological in nature and approved by a Department faculty member. Research has long been recognized as one of the high impact practices that lead to improved educational experiences for students.

Biology faculty members have long been involved in securing collaborative research grants to improve teaching and learning. Dr. Mark Running received a National Science Foundation funding for a paid summer research program for undergraduates (NSF REU). This significant training award brought together collaborating investigators in plant biology for the expressed purpose of training undergraduate students in research labs where the focus was putting the scientific method to practice.

Dr. Joe Steffen has long collaborated with faculty in the College of Education and Human Development on grants for education research, including one from the Kentucky Department of Education involving Bullitt County Educators Studying Science Teaching Practices, another from the NSF for the Louisville Area Science and Mathematics Alliance for Recruitment and Teacher Education Reform (LA-SMARTER), and another from the NSF for Partnership for Retention Improvements in Mathematics, Engineering, and Science (PRIMES). This latter grant was the springboard for developing a Biology class specific for providing undergraduate students with a teaching experience. His initial work with the PRIMES grant found undergraduate teaching assistants were a valuable addition to the lab classroom as they provided students taking the lab class another source of help. Undergraduate student performance increased in these core lab classes and an additional finding was the undergraduate lab assistant benefitted a great deal by teaching other students. Biology capitalized on this type of training and created it's own course, Biology 430, Undergraduate Teaching Assistant, in which the students get academic credit for supervised teaching of other students. They are also involved with regularly scheduled discussions of teaching methods, evaluation methods, ethical considerations in the classroom, etc. They are required to make oral presentations on content material to the class as well as submit written materials for evaluation. Students in this class were first assigned to assist in the first semester major's course, but have now been assigned to upper division core labs for majors. Having undergraduate lab assistants is not a new concept in higher education for

natural sciences, but is one that is newer to U of L and is proving to be a valuable addition to the educational experience of students.

vi. Commitment to ongoing assessment and improvement of teaching and learning quality:

Biology is committed to ongoing assessment in order to continually make improvements in teaching and learning quality. This commitment is demonstrated in classroom observations and evaluations made by peer faculty for each faculty promotion case. In addition, many faculty have been invited to observe their peers and give feedback about things noted during such class visits. The Department Chair has visited most classes to observe teaching styles of the faculty and provide feedback. Biology faculty have always been collaborative at helping each other with teaching methodologies. An example is the use of Peerwise by Dr. Susanna Remold and her discussion of it at a faculty meeting. A result of this discussion has been the addition of this technology by Dr. Mike Perlin in his large genetics course. Another example has been the use of either Tegrity or Adobe Presenter (older Breeze software) to record lecture material that students can access before class so class time can be spent discussing the recorded content. Dr. Joe Steffen is starting to use this "flipped" classroom technology in his large first year Biology class.

Some faculty have reported using mid-term courses evaluations from students in order to consider class changes during the semester. Such course surveys help in course development and improve the learning experience of current students in the course. The use of Blackboard by most faculty has made the use of surveys and getting student feedback very easy.

Biology used exit interviews for years with graduating seniors in order to evaluate good and bad experiences of its students. Although these interviews were extremely valuable, they were also extremely time consuming given the number of graduating majors in Biology each semester. Nevertheless, program evaluation was deemed necessary in order to assess and improve on the quality educational experiences students should be receiving. In order to better assess the effectiveness of the Biology curriculum, an online assessment exam and survey were developed. This assessment was set up in Blackboard so it could be used outside of class, to help assess advancement through the Biology curriculum. The use of this assessment has now spread to Admissions and is used to advise new entering students during orientation sessions which Biology class to start with in their first semester. A detailed explanation of this assessment exam is attached to this document. Of particular note, is how this assessment tool has expanded to several of the community colleges as a means of assisting transfer students determine their readiness for the four-year Biology curriculum. The assessment exam also assists transfer students by directing them into the right beginning class and off to a stronger start at the four-year institution. This assessment was part of the Kentucky Tuning and the Kentucky Quality Collaborations projects funded by the Lumina Foundation through the Council on Post Secondary Education grant from the AAC&U. It is interesting to note that the Biology assessment was proposed in the Department's first application to the Weber Award the first year it was given. Despite not winning the award that year, the Department developed the Biology assessment and has maintained and expanded it greatly since that time.

vii. Commitment to fulfilling the university's mission around educational excellence:

The Biology department is committed to preparing its undergraduate students to enter and succeed in medical, dental, veterinary, pharmacy, allied health and public health post-graduate programs, as well as to be competitive for graduate school programs. The Department's mission statement clearly indicates that: "The mission of the Biology Department is to identify and respond to the life science needs of the Commonwealth of Kentucky by providing premier opportunities in undergraduate and graduate education. The department is dedicated to developing and disseminating new knowledge gained from national and international research. The department faculty serve as a

reliable, independent source of environmental and life science information for public, private, and governmental sectors of society." Faculty are involved in many outreach programs ranging from elementary school, high schools, the community, and indicates the level of dedication by this group of faculty. Dedicated to furthering life science education through research.

Changes in higher education are occurring and the Biology department is well situated to embrace and contribute to these changes. The Lumina Foundation launched a second version of the Degree Qualifications Profile (DQP) this past October. That profile defines clear learning outcomes for associate, bachelor's and master's degrees that reflect a quality postsecondary education to serve students well as they prepare for further education, rewarding careers and fulfilling lives. After four years of faculty-led beta testing at more than 400 colleges and universities, the DQP is ready for adoption at all types of institutions. Whether this adoption occurs or not remains to be determined, however, it is hoped that the DQP's learning outcomes will:

- Engage faculty members in the vital work of improving courses and programs of study in tandem with Tuning processes;
- Make educational pathways more clear and concrete for students; and
- Help focus and streamline the accreditation process.

As the DQP continues to be tested, challenged, and altered over the next several years, the Biology department at the University of Louisville certainly has a faculty devoted to improving courses and programs of study to better serve the students.

Section III. Attachments: Include supporting materials and other documentation relevant to the accomplishments described in the narrative

1. **Student Opinion Survey** – Biology – Pages 15-23 are specifically questions about Biology
2. **Biology Assessment** – Used to place students in first Biology class, assess the curriculum, aid transfer student placement.

Report: 2013 A&S Student Opinion Survey--Biology

2013 A&S Student Opinion Survey--Biology

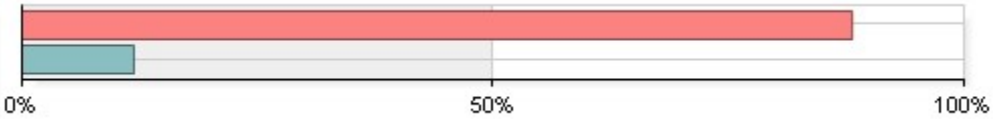
Project Audience 996
Responses Received 178
Response Ratio 17.87%

Creation Date Thu, Jan 30, 2014

Powered by: BLUE

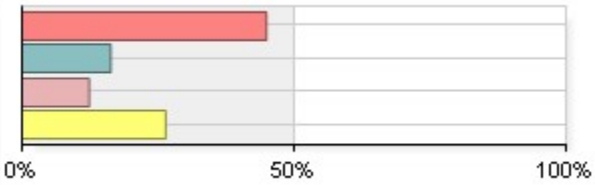
Enrollment Status

1 Full-time	156	88.14%
2 Part-time	21	11.86%
Total	177	



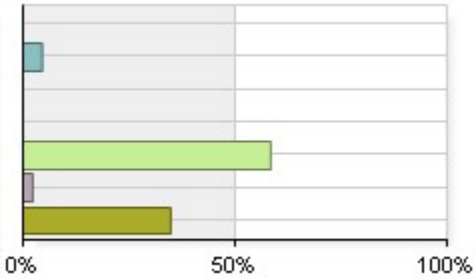
Current status at A&S

1 Less than 30 semester hours credit	80	44.94%
2 30 or more but fewer than 60 semester hours credit	29	16.29%
3 60 or more but fewer than 90 semester hours credit	22	12.36%
4 90 or more semester hours credit	47	26.40%
Total	178	



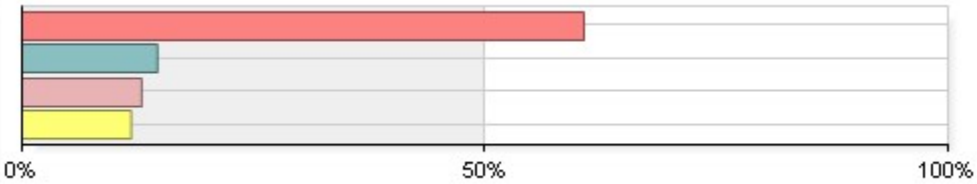
Which Computer Center on campus do you use most often?

1 North (in the College of Business)	0	0.00%
2 South (in the Miller Information Technology Center - lower level)	8	4.49%
3 HSC (Health Sciences Center)	0	0.00%
4 A department lab	0	0.00%
5 Ekstrom	104	58.43%
6 REACH center computers	4	2.25%
7 Do not use campus computers	62	34.83%
Total	178	



Approximately how many miles do you travel to campus?

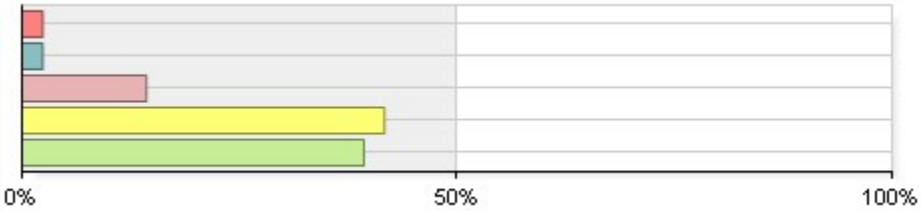
1 0-4.9	108	60.67%
2 5-9.9	26	14.61%
3 10.0-14.9	23	12.92%
4 15 or more	21	11.80%
Total	178	



Satisfaction with Student Services, Campus Environment, and Campus Health Services

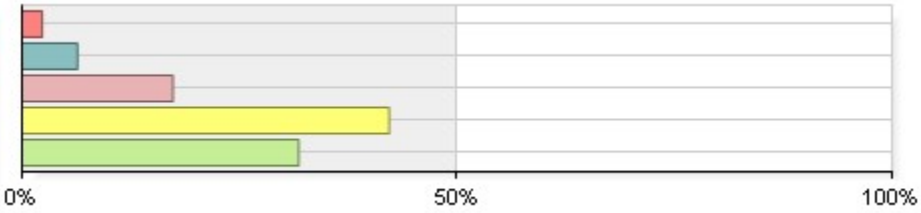
1. Admissions

1 Very Dissatisfied	4	2.38%
2 Dissatisfied	4	2.38%
3 Neutral	24	14.29%
4 Satisfied	70	41.67%
5 Very Satisfied	66	39.29%
Total	168	



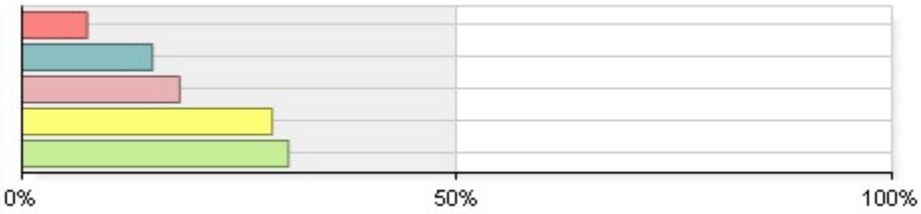
2. Registration services

1 Very Dissatisfied	4	2.31%
2 Dissatisfied	11	6.36%
3 Neutral	30	17.34%
4 Satisfied	73	42.20%
5 Very Satisfied	55	31.79%
Total	173	



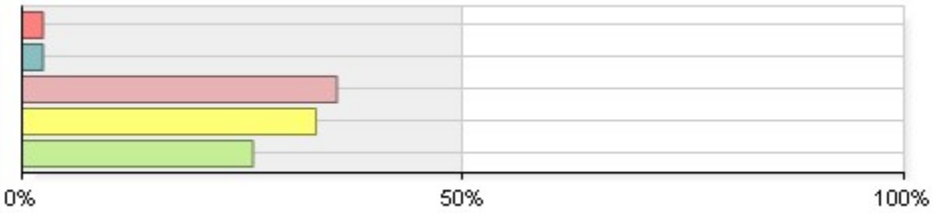
3. Financial aid

1 Very Dissatisfied	12	7.50%
2 Dissatisfied	24	15.00%
3 Neutral	29	18.13%
4 Satisfied	46	28.75%
5 Very Satisfied	49	30.63%
Total	160	



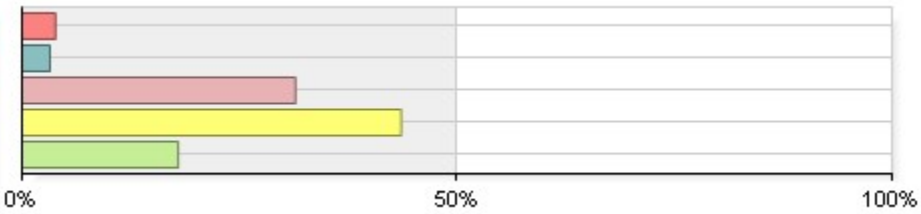
4. Availability of assistantships (graduate students only)

1 Very Dissatisfied	1	2.38%
2 Dissatisfied	1	2.38%
3 Neutral	15	35.71%
4 Satisfied	14	33.33%
5 Very Satisfied	11	26.19%
Total	42	



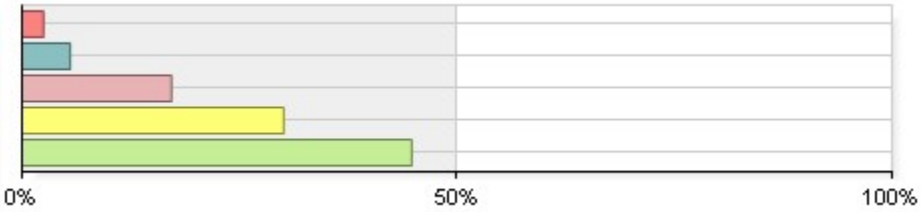
5. Student affairs

1 Very Dissatisfied	6	3.85%
2 Dissatisfied	5	3.21%
3 Neutral	49	31.41%
4 Satisfied	68	43.59%
5 Very Satisfied	28	17.95%
Total	156	



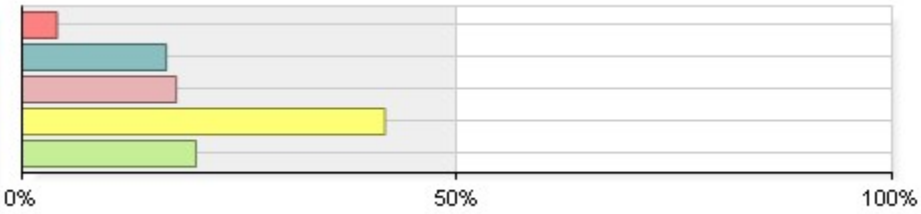
6. Recreational facilities

1 Very Dissatisfied	4	2.45%
2 Dissatisfied	9	5.52%
3 Neutral	28	17.18%
4 Satisfied	49	30.06%
5 Very Satisfied	73	44.79%
Total	163	



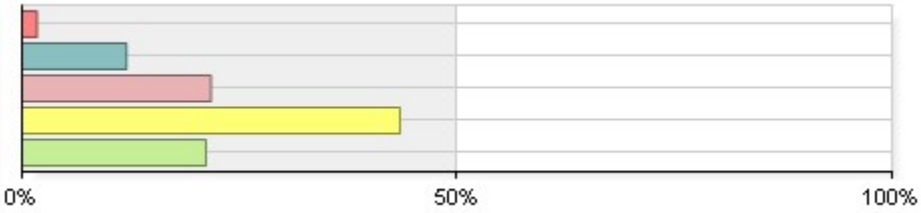
7. Food services

1 Very Dissatisfied	7	4.00%
2 Dissatisfied	29	16.57%
3 Neutral	31	17.71%
4 Satisfied	73	41.71%
5 Very Satisfied	35	20.00%
Total	175	



8. Condition of classrooms and physical facilities

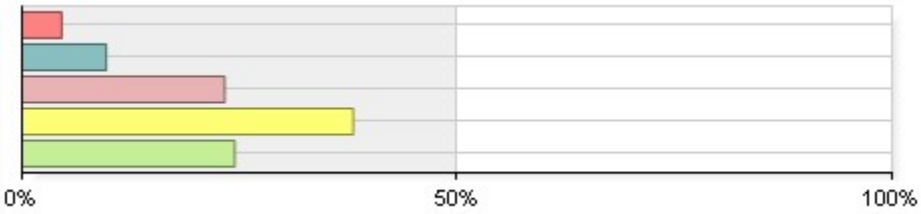
1 Very Dissatisfied	3	1.71%
2 Dissatisfied	21	12.00%
3 Neutral	38	21.71%
4 Satisfied	76	43.43%
5 Very Satisfied	37	21.14%
Total	175	



Satisfaction with Student Services, Campus Environment, and Campus Health Services (continued)

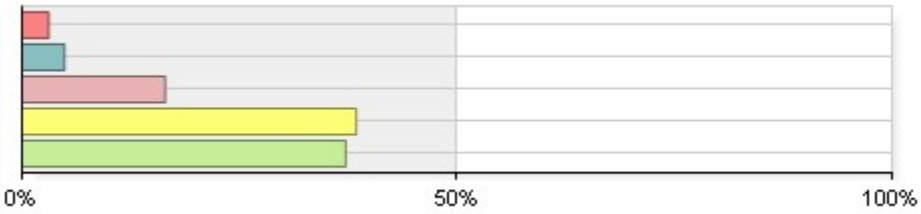
9. Campus safety and security

1 Very Dissatisfied	8	4.55%
2 Dissatisfied	17	9.66%
3 Neutral	41	23.30%
4 Satisfied	67	38.07%
5 Very Satisfied	43	24.43%
Total	176	



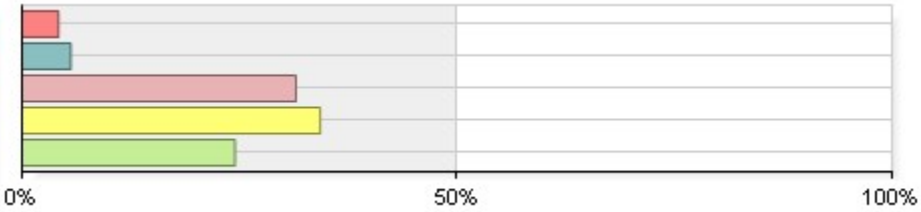
10. Campus library services, as they relate to my field of study

1 Very Dissatisfied	5	3.05%
2 Dissatisfied	8	4.88%
3 Neutral	27	16.46%
4 Satisfied	63	38.41%
5 Very Satisfied	61	37.20%
Total	164	



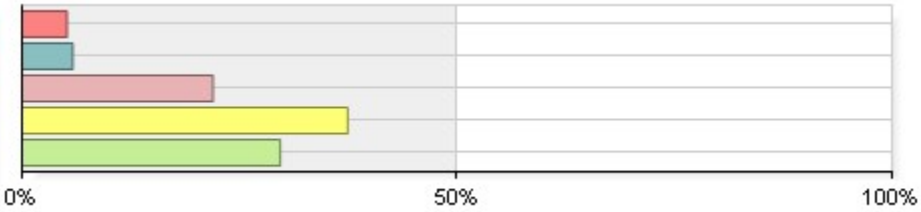
11. Campus bookstore electronic book ordering system

1 Very Dissatisfied	6	4.20%
2 Dissatisfied	8	5.59%
3 Neutral	45	31.47%
4 Satisfied	49	34.27%
5 Very Satisfied	35	24.48%
Total	143	



12. Availability of wellness and preventative health resources

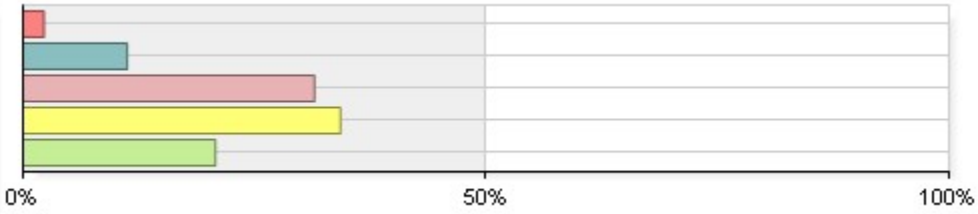
1 Very Dissatisfied	8	5.16%
2 Dissatisfied	9	5.81%
3 Neutral	34	21.94%
4 Satisfied	58	37.42%
5 Very Satisfied	46	29.68%
Total	155	



Overall Impression

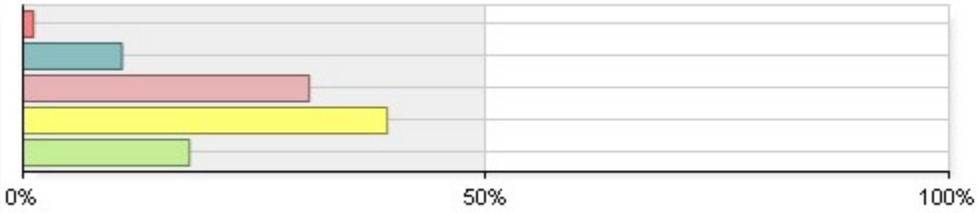
1. My overall impression of student life at UofL

1 Poor	4	2.25%
2 Fair	20	11.24%
3 Good	56	31.46%
4 Very Good	61	34.27%
5 Excellent	37	20.79%
Total	178	



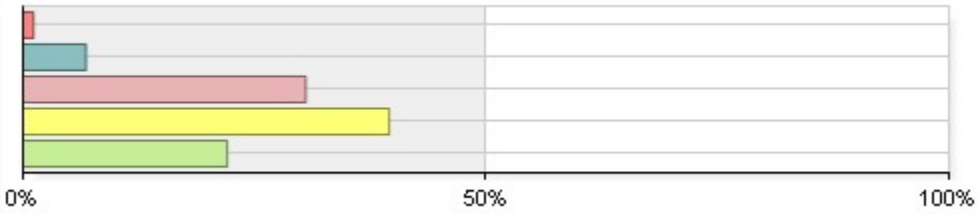
2. My overall impression of academic standards at UofL

1 Poor	2	1.12%
2 Fair	19	10.67%
3 Good	55	30.90%
4 Very Good	70	39.33%
5 Excellent	32	17.98%
Total	178	



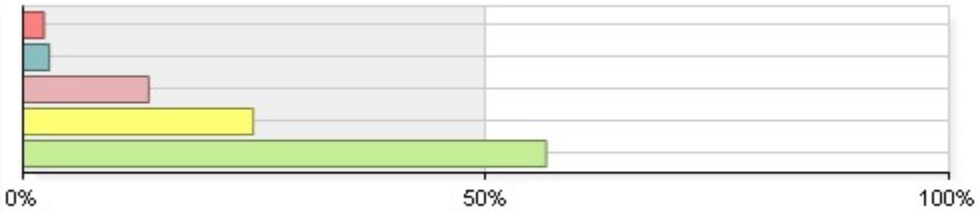
3. My overall impression of UofL as an institution of higher learning

1 Poor	2	1.13%
2 Fair	12	6.78%
3 Good	54	30.51%
4 Very Good	70	39.55%
5 Excellent	39	22.03%
Total	177	



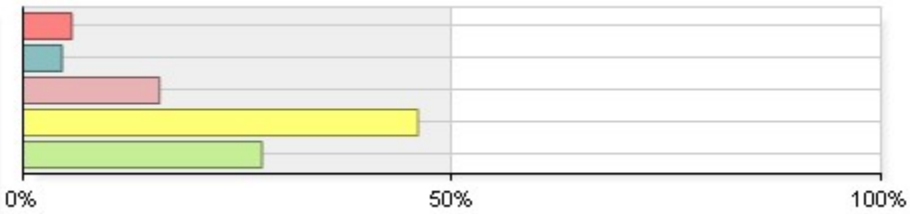
4. Likelihood that I will complete my degree at UofL

1 Poor	4	2.26%
2 Fair	5	2.82%
3 Good	24	13.56%
4 Very Good	44	24.86%
5 Excellent	100	56.50%
Total	177	



My experience at UofL has included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or writing assignments

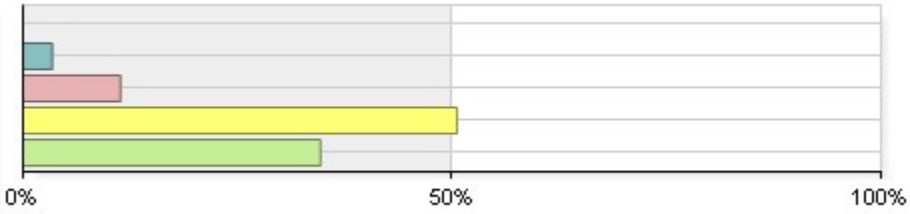
1 Strongly Disagree	10	5.68%
2 Disagree	8	4.55%
3 Neutral	28	15.91%
4 Agree	81	46.02%
5 Strongly Agree	49	27.84%
Total	176	



Please rate your agreement with the following statements:

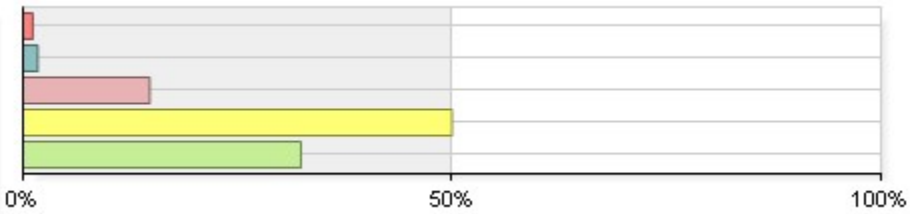
1. The university promotes diversity, equal opportunity, and social justice

1 Strongly Disagree	0	0.00%
2 Disagree	6	3.41%
3 Neutral	20	11.36%
4 Agree	89	50.57%
5 Strongly Agree	61	34.66%
Total	176	



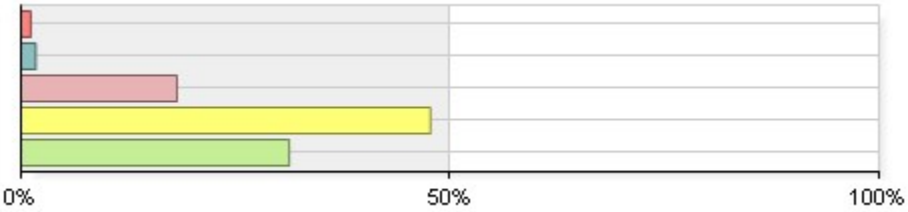
2. The College of Arts & Sciences promotes diversity, equal opportunity, and social justice

1 Strongly Disagree	2	1.14%
2 Disagree	3	1.70%
3 Neutral	26	14.77%
4 Agree	88	50.00%
5 Strongly Agree	57	32.39%
Total	176	



3. The faculty in the College of Arts & Sciences promote diversity, equal opportunity, and social justice

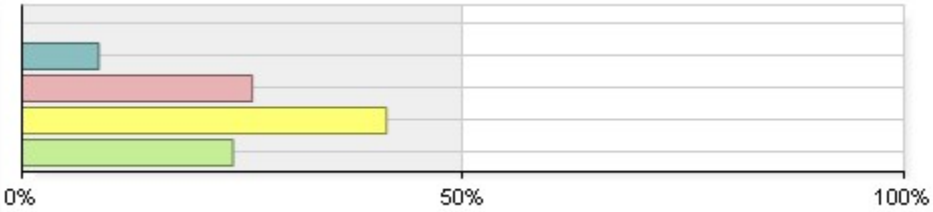
1 Strongly Disagree	2	1.14%
2 Disagree	3	1.70%
3 Neutral	32	18.18%
4 Agree	84	47.73%
5 Strongly Agree	55	31.25%
Total	176	



If you have taken Distance Education Courses, please rate your satisfaction with the following:

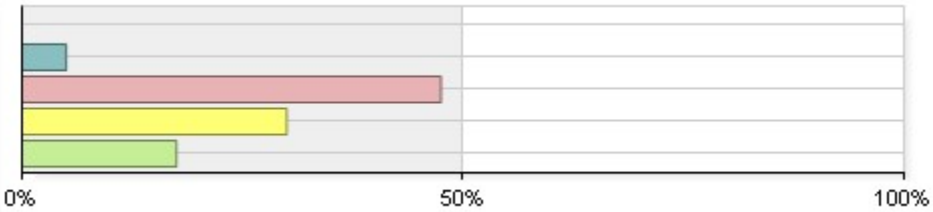
1. Selection and availability of courses you have taken

1 Very Dissatisfied	0	0.00%
2 Dissatisfied	4	8.70%
3 Neutral	12	26.09%
4 Satisfied	19	41.30%
5 Very Satisfied	11	23.91%
Total	46	



2. Quality of online learning experience of courses you have taken

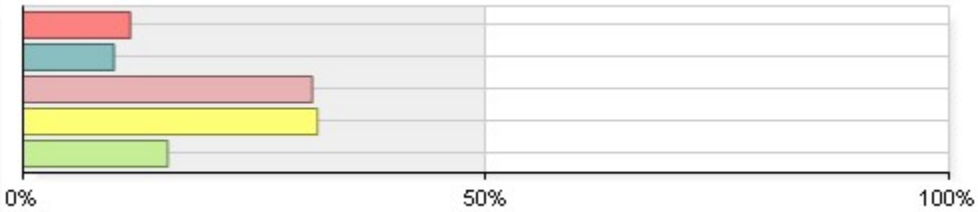
1 Very Dissatisfied	0	0.00%
2 Dissatisfied	2	5.00%
3 Neutral	19	47.50%
4 Satisfied	12	30.00%
5 Very Satisfied	7	17.50%
Total	40	



Please rate the impact of your overall experience as a student at UofL on the following:

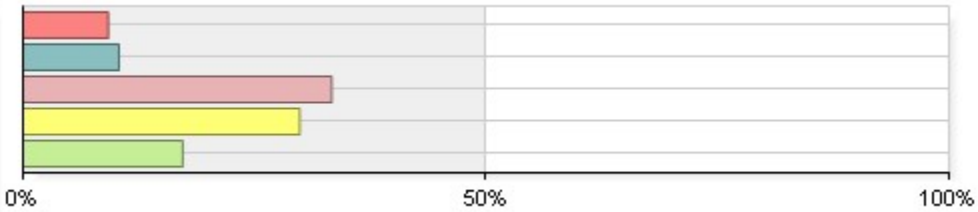
1. Written communication skills

1 Very Little	20	11.56%
2 Some	17	9.83%
3 Neutral	54	31.21%
4 Quite a Bit	55	31.79%
5 Very Much	27	15.61%
Total	173	



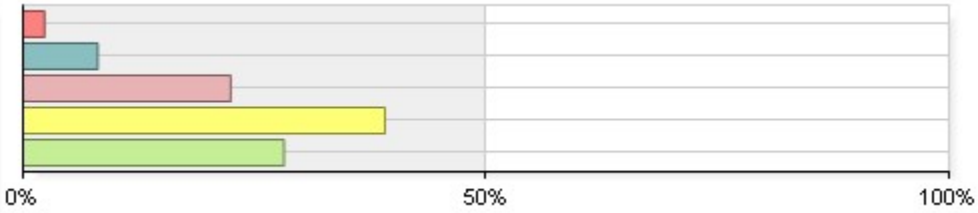
2. Oral communication skills

1 Very Little	16	9.20%
2 Some	18	10.34%
3 Neutral	58	33.33%
4 Quite a Bit	52	29.89%
5 Very Much	30	17.24%
Total	174	



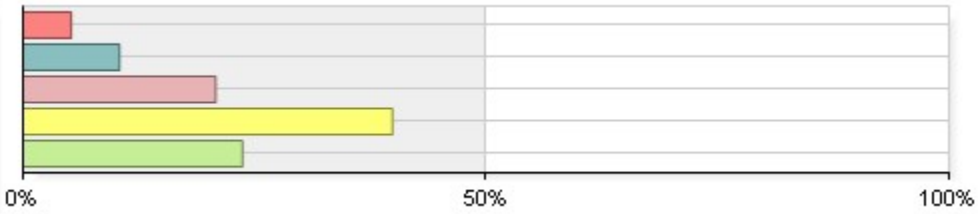
3. Critical thinking

1 Very Little	4	2.30%
2 Some	14	8.05%
3 Neutral	39	22.41%
4 Quite a Bit	68	39.08%
5 Very Much	49	28.16%
Total	174	



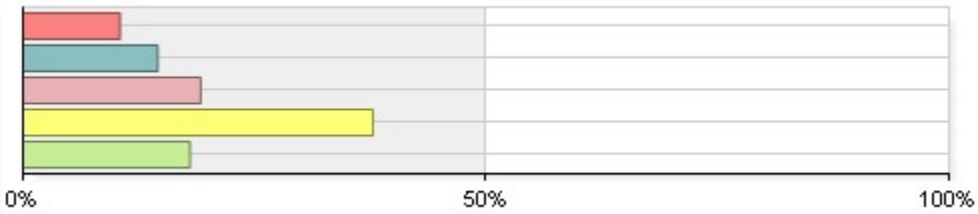
4. Awareness of cultural diversity and related issues

1 Very Little	9	5.20%
2 Some	18	10.40%
3 Neutral	36	20.81%
4 Quite a Bit	69	39.88%
5 Very Much	41	23.70%
Total	173	



5. To what extent have the University's general education requirements contributed to my overall education

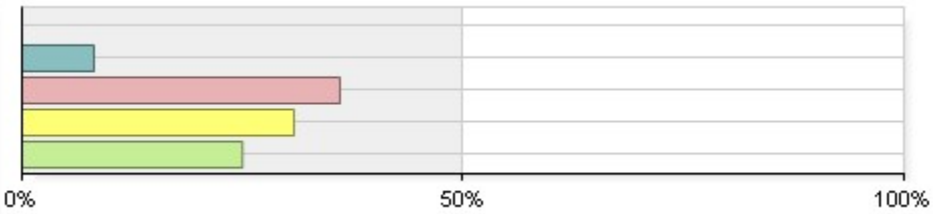
1 Very Little	18	10.47%
2 Some	25	14.53%
3 Neutral	33	19.19%
4 Quite a Bit	65	37.79%
5 Very Much	31	18.02%
Total	172	



Please rate the quality of the following as it relates to the College of Arts and Sciences:

1. Helpfulness and friendliness of the staff (including advisors, coop/career placement, student services) in Gardiner Hall

1 Extremely Poor	0	0.00%
2 Below Average	14	8.14%
3 Average	62	36.05%
4 Above Average	53	30.81%
5 Excellent	43	25.00%
Total	172	

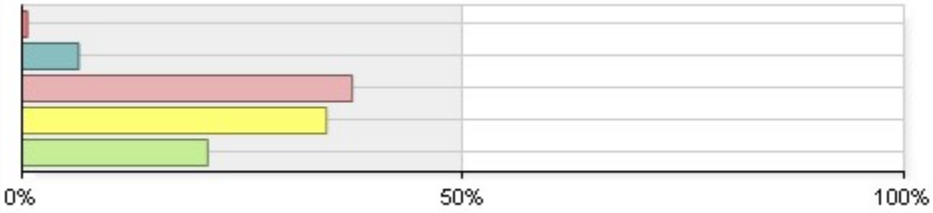


2. Availability of staff academic advisors in Gardiner Hall

1 Extremely Poor	2	1.17%
2 Below Average	13	7.60%
3 Average	70	40.94%
4 Above Average	53	30.99%
5 Excellent	33	19.30%
Total	171	

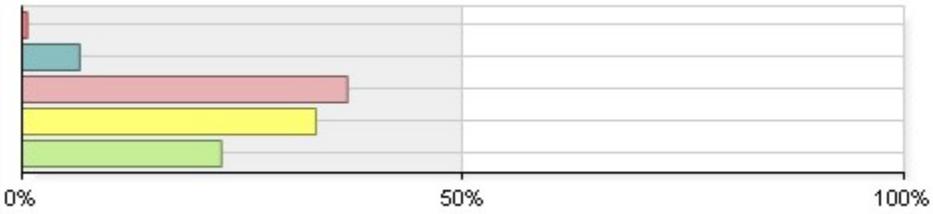
3. Knowledge of academic requirements by staff academic advisors in Gardiner Hall

1 Extremely Poor	1	0.58%
2 Below Average	11	6.43%
3 Average	64	37.43%
4 Above Average	59	34.50%
5 Excellent	36	21.05%
Total	171	



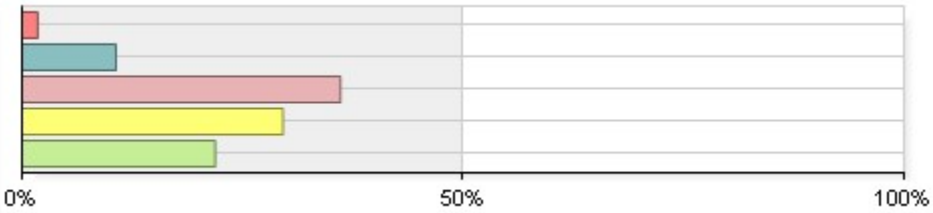
4. Accuracy of information provided by advising in Gardiner Hall

1 Extremely Poor	1	0.60%
2 Below Average	11	6.55%
3 Average	62	36.90%
4 Above Average	56	33.33%
5 Excellent	38	22.62%
Total	168	



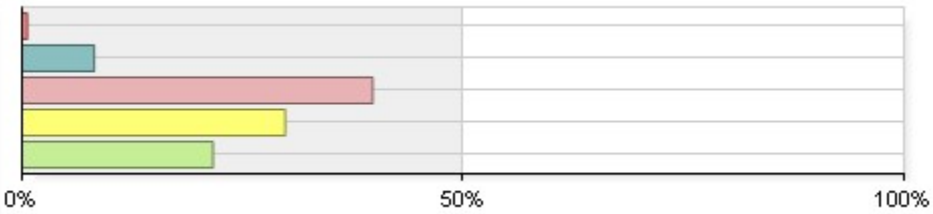
5. Availability of advisors in Gardiner Hall to answer my questions/concerns

1 Extremely Poor	3	1.78%
2 Below Average	18	10.65%
3 Average	61	36.09%
4 Above Average	50	29.59%
5 Excellent	37	21.89%
Total	169	



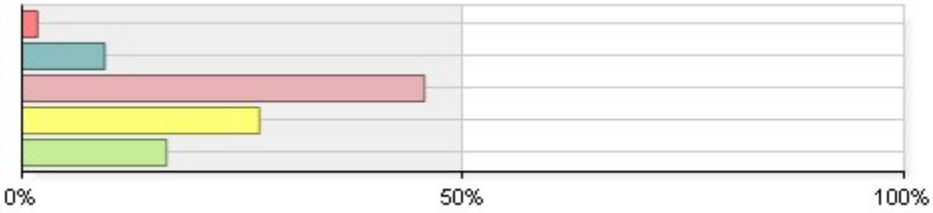
6. Knowledge by advisors in Gardiner Hall of resources that would assist me

1 Extremely Poor	1	0.58%
2 Below Average	14	8.19%
3 Average	68	39.77%
4 Above Average	51	29.82%
5 Excellent	37	21.64%
Total	171	



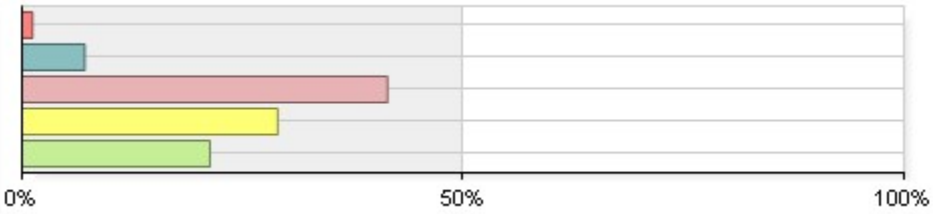
7. Condition of classrooms and other physical facilities (student lounge areas, space to meet with professors)

1 Extremely Poor	3	1.75%
2 Below Average	16	9.36%
3 Average	78	45.61%
4 Above Average	46	26.90%
5 Excellent	28	16.37%
Total	171	



8. My overall impression of the academic advising services provided by A&S advising in Gardiner Hall

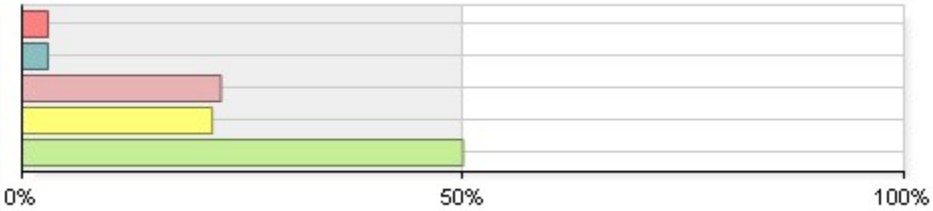
1 Extremely Poor	2	1.18%
2 Below Average	12	7.10%
3 Average	70	41.42%
4 Above Average	49	28.99%
5 Excellent	36	21.30%
Total	169	



Please rate the quality of the following as it relates to the College of Arts and Sciences: (continued)

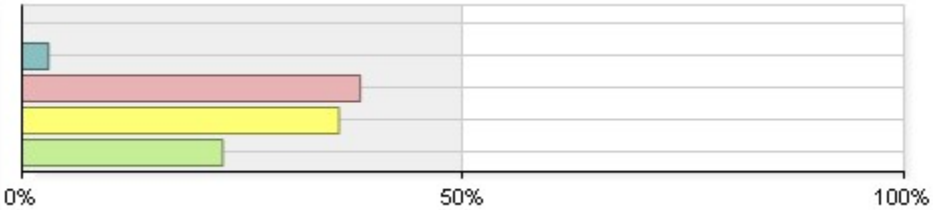
9. My overall impression of the academic counseling and advising services provided by the Honors Program **(ANSWER ONLY IF YOU RECEIVED ADVISING FROM THE HONORS PROGRAM)**

1 Extremely Poor	3	2.94%
2 Below Average	3	2.94%
3 Average	23	22.55%
4 Above Average	22	21.57%
5 Excellent	51	50.00%
Total	102	



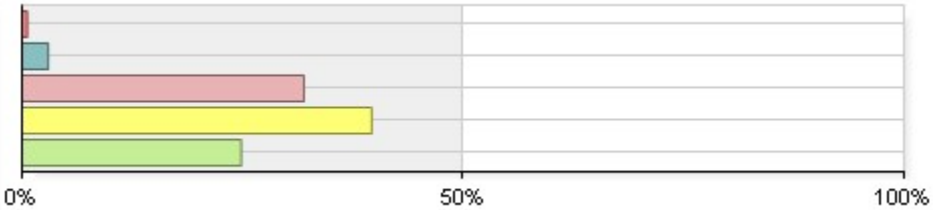
10. My overall impression of the academic standards of the College of Arts and Sciences

1 Extremely Poor	0	0.00%
2 Below Average	5	2.99%
3 Average	64	38.32%
4 Above Average	60	35.93%
5 Excellent	38	22.75%
Total	167	



11. My overall impression of the College of Arts and Sciences

1 Extremely Poor	1	0.59%
2 Below Average	5	2.96%
3 Average	54	31.95%
4 Above Average	67	39.64%
5 Excellent	42	24.85%
Total	169	



Availability of A&S courses outside my major at the times I need them

Comment
1. Only had problems because I came to late orientation so I had to take whatever lasses were left. I feel the advisers at orientation could have done a better job with knowing the classes and not just placing students anywhere.
2. There are classes that I would truly enjoy taking and that would benefit me wanting to be pre-med that I just am not allowed to take. Class time availabilities clash.
3. Yes. They're all at the same time.
4. n/a
5. I do not like that for any sociology class or psychology class, I have to wait a few weeks to be able to schedule for it and risk not being able to get the class that I had to plan for.
6. None.
7. Fine
8. There are a lot of classes I need that haven't shown up Fall or Spring the last two years. If that continues my senior year, I may not fulfill my requirements.
9. N/A
10. Basic public speaking
11. Calculus 3 clashed with both my Biology and my Chemistry class.
12. Kept trying to take Histology, but my name rotation always put me at the back of the list and I was always waitlisted.
13. Yes I wanted to take Chem 209 but it would not allow me to enroll in it. I went through a long list of contacts until

I finally was able to talk to someone who could put me on the list to enroll. After hours of waiting, I finally could enroll in the class.

14. Hours offered

15. The weird alphabet scheduling limited what classes I could take for the spring semester as I went last out of everyone which put me behind instead of ahead.

16. Chem 201 and 207 at around 10-3. I'm currently on the wait list for Spring semester, and need to be in the class around this time if I wish to be employed as well.

17. I was not able to take chem 207 and 208 in the fall of 2013 while I took chem 201, this put me behind in lab and I will now have to take a lab over the summer.

18. yes

19. na

20. Most courses I need seem to only be available at the same time of day so i cant take the classes I need

21. If taking more than one lab it was difficult to schedule because they were mostly all at the same times and days

22. I noticed that many of the elective non-WR biology courses in the spring overlap with times, which made it very difficult to enroll in electives that I needed for my last semester.

23. Some semesters have been very hard to schedule because of class overlap

24. Classes are not available to students such as myself who are attempting to complete a degree so far away from home. There needs to be more availability of classes to students local to the Elizabethtown, KY area. Driving 46 miles each way, each day of classes is hard on me, my time schedule, my vehicle, and adversely affects my academic abilities. The schedule of available classes is geared toward people who are either living on, or much closer to campus than students driving such a long way to receive an education.

25. I did not have problems with courses OUTSIDE my major. I had problem with courses IN my major.

26. I was in the last orientation and was one of the last people to register. I was told to register for classes that I had taken for college credit in high school because they were not sure if i would receive credit for them. I ended up being able to transfer twenty-two credits over along with any AP credit. I then had to drop a few of my classes I had registered for because I had transfer credit and AP credit. I was unable to take the classes that I wanted because now they were all full. I also ended up with a schedule that is very inconvenient for me as a commuter. I end up having to spend extra time on campus because I have class at nine in the morning and at seven in the evening. I was very frustrated when trying to register for classes and create a schedule that would allow me to make the most of my time during this semester.

27. I am normally a fulltime student but due to a lack of classes that I need or the availability of those classes I am only part time this semester. For example I needed Math 180 this semester there were only 2 classes offered and both of them started at 8 am. I am a single mom and have to get my kids to school so any classes before 9 am are not going to work for me. I had the same problem signing up for ASL classes they only offer classes at or after 4 pm. I attempted today to sign up for classes for spring 2014, 2 days ago I put all my classes in my cart in preparation, checked to make sure there were no holds on my account and when I tried to register today 2 of my classes were already waitlisted and I couldn't sign up for the other 2 because there was a hold on my account for advising. I am beyond upset about this, I didn't get the classes I wanted or needed this semester and it looks like I won't be getting them next semester either. JCTC had a better selection of classes and times. I am disappointed in UL, you would think a big University would have more to offer.

28. did not have any

29. No

30. I have never had advising in Gardiner Hall and don't know how to deselect my choices

31. The times for some of the common courses (bio 242) are right in the middle of the day or late at night and conflict with many other courses. Maybe more times for the common course or different times.

32. As for now, I have No restrictions and no difficulty.

33. I have had trouble with classes not being offered in the semester that I need them. It would be nice to be able to take a class in whatever semester I need. For example, I (and several other students I have talked to) wanted to take ASL 202 in the fall because, for a variety of reasons, we could not take it in the spring. There should at least be one or two classes offered in each semester. Now I either have to take it in the summer, or next spring right before I graduate. I would have liked to have a somewhat easier class at the same time that I am taking my more difficult classes. However, the way the classes are scheduled makes this difficult to do. Not everyone can stay on a schedule for consecutive classes such as ASL 101, 102, 201, and 202. Sometimes we must skip a semester.

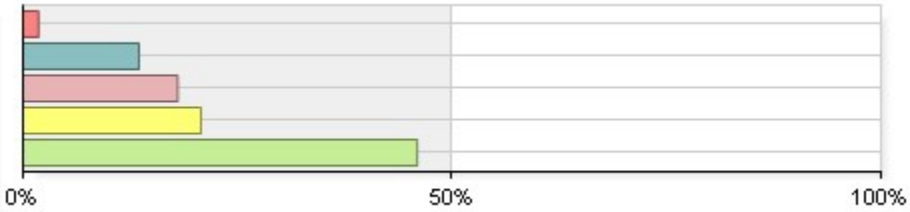
34. Due to an over abundance of adviser appointments even a bit early before class registration deadlines, I could

not get into certain required classes for my major due to a hold on my account demanding I speak to an adviser beforehand. This happened in my earlier years at U of L and had the impact of making me graduate in 5 years instead of 4.

Please rate your agreement with the following as it relates to the Study Abroad program:

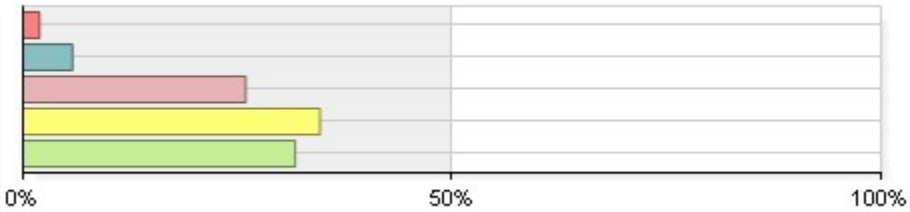
1. Opportunities to study abroad are important to me

1 Strongly Disagree	2	1.80%
2 Disagree	15	13.51%
3 Neutral	20	18.02%
4 Agree	23	20.72%
5 Strongly Agree	51	45.95%
Total	111	



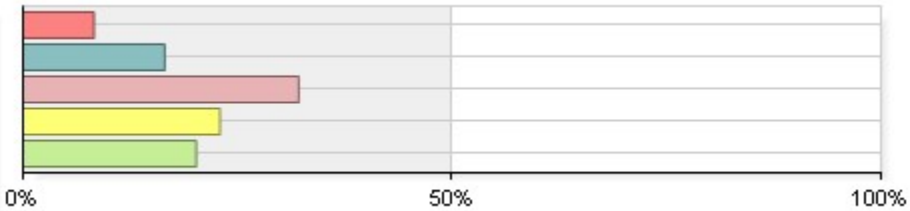
2. I am satisfied with the opportunities for study abroad available to me at UofL

1 Strongly Disagree	2	1.92%
2 Disagree	6	5.77%
3 Neutral	27	25.96%
4 Agree	36	34.62%
5 Strongly Agree	33	31.73%
Total	104	



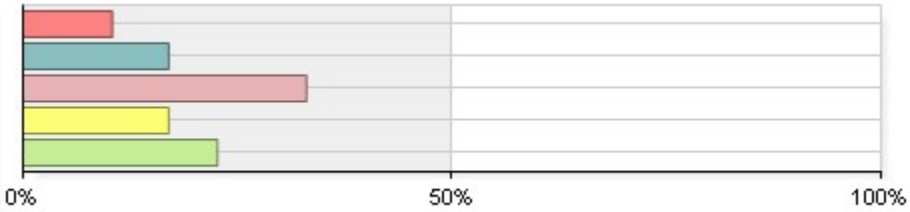
3. My department has given me sufficient information about opportunities for UofL students to study abroad

1 Strongly Disagree	9	8.26%
2 Disagree	18	16.51%
3 Neutral	35	32.11%
4 Agree	25	22.94%
5 Strongly Agree	22	20.18%
Total	109	



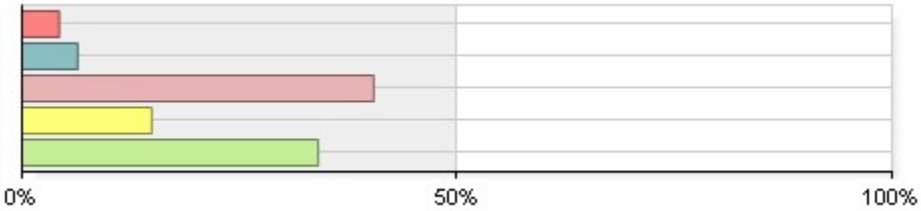
4. My advisor has given me sufficient information about opportunities for UofL students to study abroad

1 Strongly Disagree	11	10.38%
2 Disagree	18	16.98%
3 Neutral	35	33.02%
4 Agree	18	16.98%
5 Strongly Agree	24	22.64%
Total	106	



5. My study abroad experience has enhanced my education

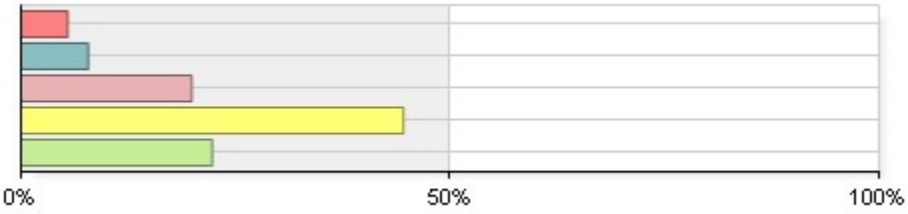
1 Strongly Disagree	2	4.26%
2 Disagree	3	6.38%
3 Neutral	19	40.43%
4 Agree	7	14.89%
5 Strongly Agree	16	34.04%
Total	47	



Please rate your agreement with the following as they relate to the Biology faculty and staff in the College of Arts and Sciences:

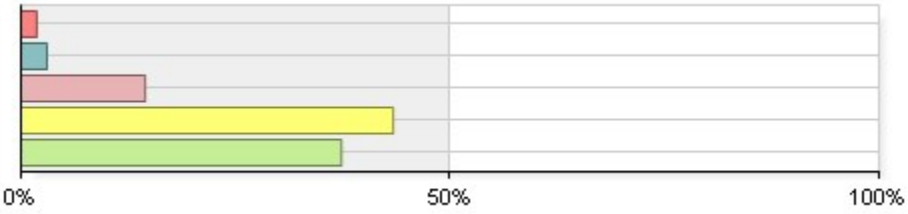
1. Show interest in my academic progress

1 Strongly Disagree	9	5.42%
2 Disagree	13	7.83%
3 Neutral	33	19.88%
4 Agree	74	44.58%
5 Strongly Agree	37	22.29%
Total	166	



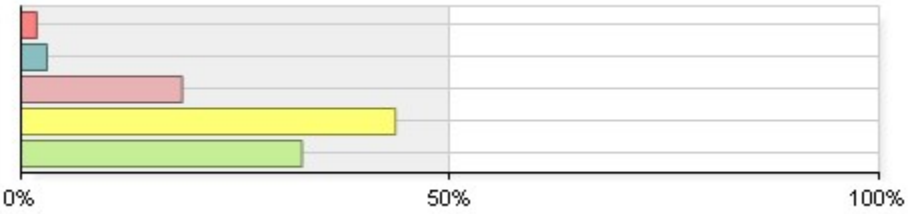
2. Provide opportunities to ask questions in class

1 Strongly Disagree	3	1.81%
2 Disagree	5	3.01%
3 Neutral	24	14.46%
4 Agree	72	43.37%
5 Strongly Agree	62	37.35%
Total	166	



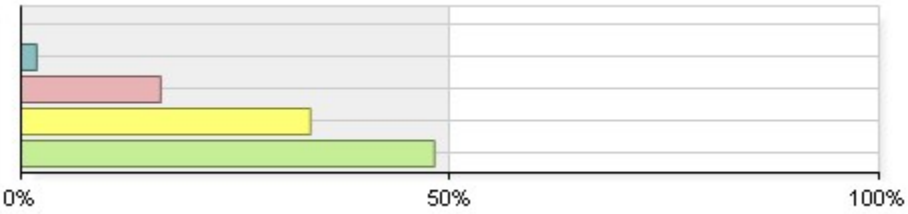
3. Availability for help outside the classroom

1 Strongly Disagree	3	1.82%
2 Disagree	5	3.03%
3 Neutral	31	18.79%
4 Agree	72	43.64%
5 Strongly Agree	54	32.73%
Total	165	



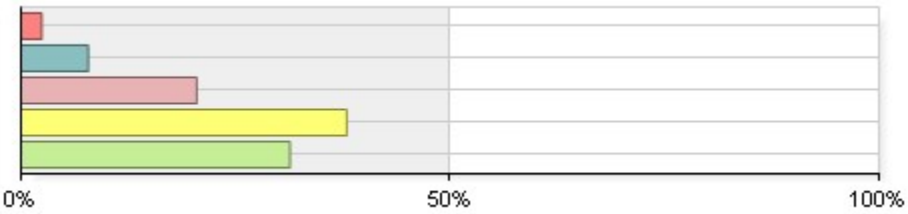
4. Display knowledge and skills regarding the subject matter

1 Strongly Disagree	0	0.00%
2 Disagree	3	1.81%
3 Neutral	27	16.27%
4 Agree	56	33.73%
5 Strongly Agree	80	48.19%
Total	166	



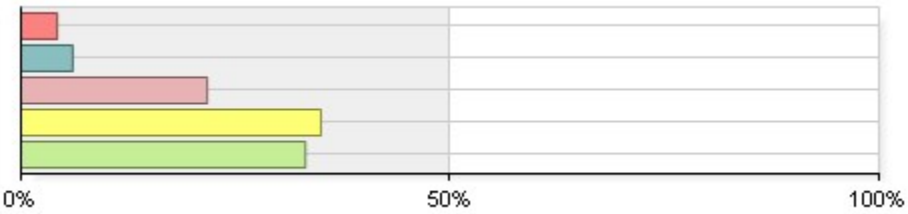
5. Communicate course material effectively

1 Strongly Disagree	4	2.41%
2 Disagree	13	7.83%
3 Neutral	34	20.48%
4 Agree	63	37.95%
5 Strongly Agree	52	31.33%
Total	166	



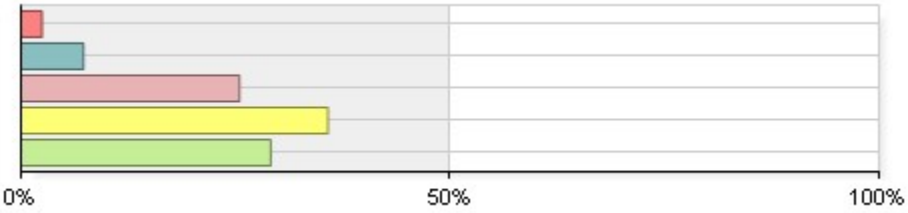
6. Demonstrate excellence in teaching

1 Strongly Disagree	7	4.22%
2 Disagree	10	6.02%
3 Neutral	36	21.69%
4 Agree	58	34.94%
5 Strongly Agree	55	33.13%
Total	166	



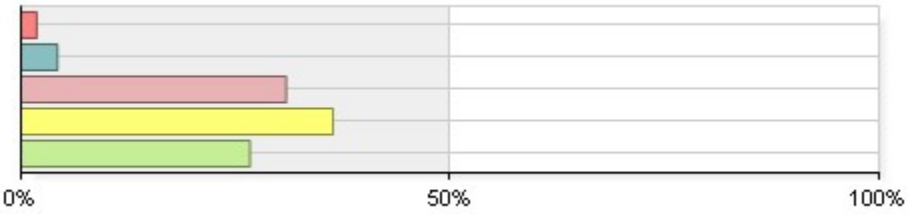
7. Accessibility of the faculty/staff for academic advising

1 Strongly Disagree	4	2.42%
2 Disagree	12	7.27%
3 Neutral	42	25.45%
4 Agree	59	35.76%
5 Strongly Agree	48	29.09%
Total	165	



8. Provide effective academic advising

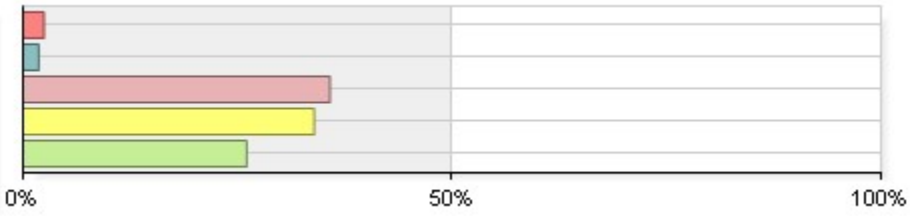
1 Strongly Disagree	3	1.82%
2 Disagree	7	4.24%
3 Neutral	51	30.91%
4 Agree	60	36.36%
5 Strongly Agree	44	26.67%
Total	165	



Please rate your agreement with the following as they relate to the Biology faculty and staff in the College of Arts and Sciences: (continued)

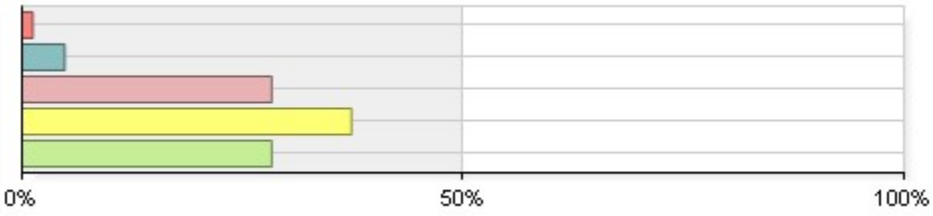
9. Demonstrate commitment to diversity

1 Strongly Disagree	4	2.42%
2 Disagree	3	1.82%
3 Neutral	59	35.76%
4 Agree	56	33.94%
5 Strongly Agree	43	26.06%
Total	165	



Overall Impression of the faculty/staff in the Biology program

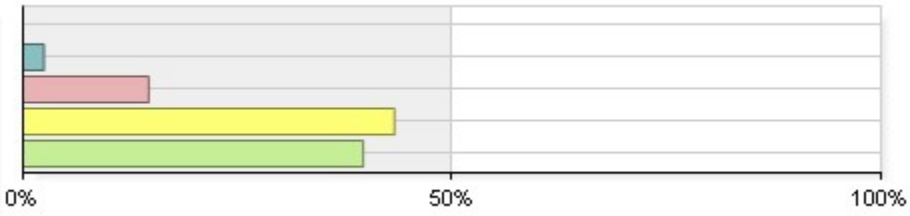
1 Extremely Poor	2	1.20%
2 Below Average	8	4.82%
3 Average	47	28.31%
4 Above Average	62	37.35%
5 Excellent	47	28.31%
Total	166	



Please rate your agreement with the following as they relate to the Biology program in the College of Arts and Sciences:

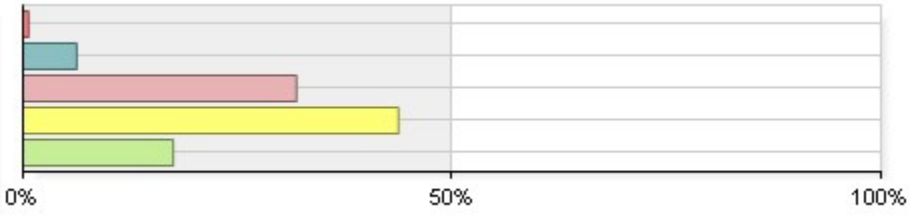
1. The Biology Program maintains strong academic standards

1 Strongly Disagree	0	0.00%
2 Disagree	4	2.44%
3 Neutral	24	14.63%
4 Agree	71	43.29%
5 Strongly Agree	65	39.63%
Total	164	



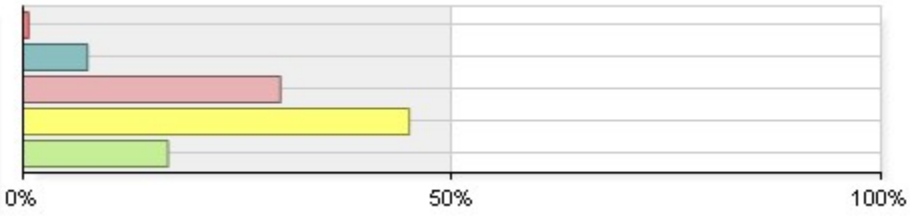
2. The equipment in the Biology labs is well maintained and updated to meet my needs to complete assignments

1 Strongly Disagree	1	0.63%
2 Disagree	10	6.25%
3 Neutral	51	31.87%
4 Agree	70	43.75%
5 Strongly Agree	28	17.50%
Total	160	



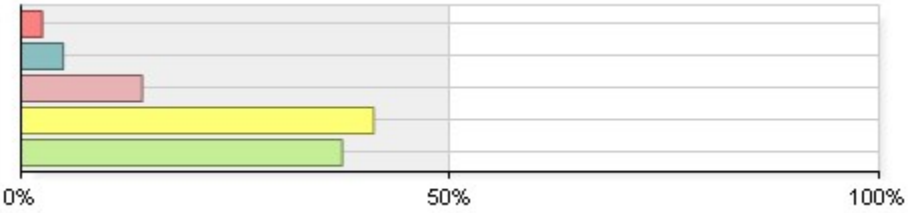
3. There are enough resources and equipment available in the Biology labs to meet my needs to complete assignments

1 Strongly Disagree	1	0.63%
2 Disagree	12	7.50%
3 Neutral	48	30.00%
4 Agree	72	45.00%
5 Strongly Agree	27	16.88%
Total	160	



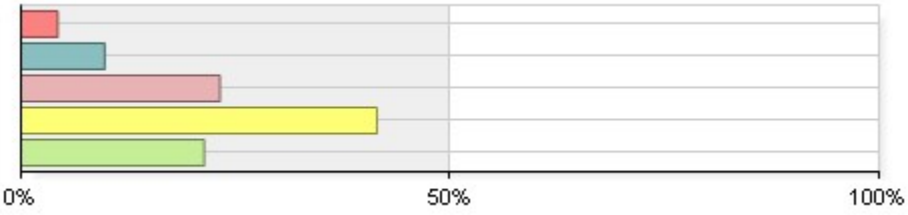
4. I have enjoyed Biology as a field of study

1 Strongly Disagree	4	2.45%
2 Disagree	8	4.91%
3 Neutral	23	14.11%
4 Agree	67	41.10%
5 Strongly Agree	61	37.42%
Total	163	



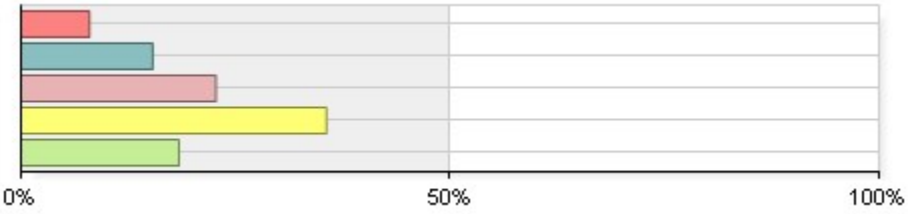
5. Enough Biology courses are offered during each semester to complete my degree as I have planned

1 Strongly Disagree	7	4.27%
2 Disagree	16	9.76%
3 Neutral	38	23.17%
4 Agree	68	41.46%
5 Strongly Agree	35	21.34%
Total	164	



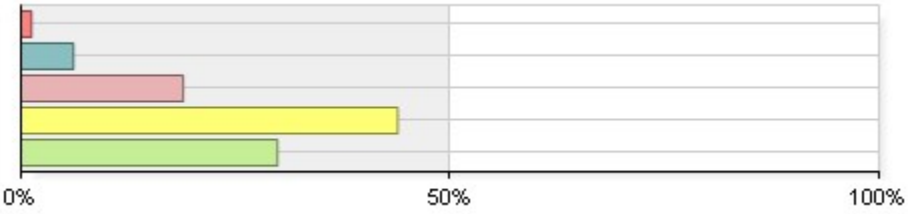
6. Biology courses are offered during times convenient to complete my degree as I have planned

1 Strongly Disagree	13	7.98%
2 Disagree	25	15.34%
3 Neutral	37	22.70%
4 Agree	58	35.58%
5 Strongly Agree	30	18.40%
Total	163	



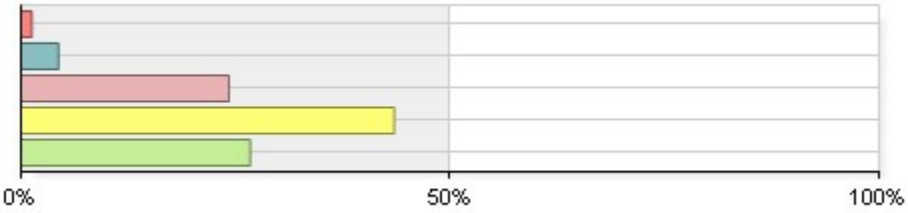
7. I have developed a strong appreciation for critical thinking as a Biology student

1 Strongly Disagree	2	1.22%
2 Disagree	10	6.10%
3 Neutral	31	18.90%
4 Agree	72	43.90%
5 Strongly Agree	49	29.88%
Total	164	



8. I have developed better problem-solving skills as a Biology student

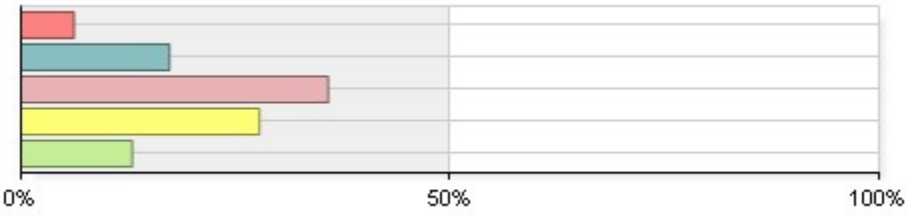
1 Strongly Disagree	2	1.24%
2 Disagree	7	4.35%
3 Neutral	39	24.22%
4 Agree	70	43.48%
5 Strongly Agree	43	26.71%
Total	161	



Please rate your agreement with the following as they relate to the Biology program in the College of Arts and Sciences: (continued)

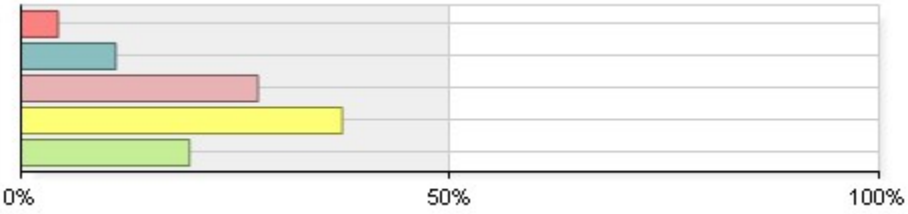
9. The Biology Program has provided me with opportunities to improve my oral communication skills

1 Strongly Disagree	10	6.17%
2 Disagree	28	17.28%
3 Neutral	58	35.80%
4 Agree	45	27.78%
5 Strongly Agree	21	12.96%
Total	162	



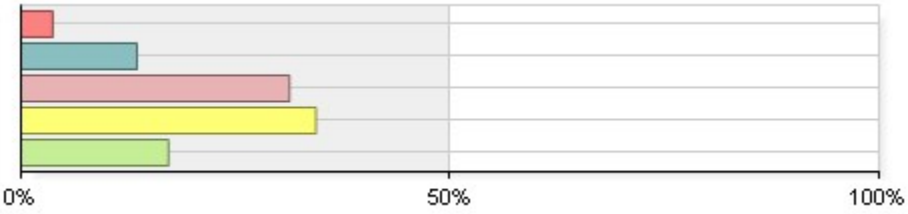
10. The Biology Program has provided me with opportunities to improve my written communication skills

1 Strongly Disagree	7	4.29%
2 Disagree	18	11.04%
3 Neutral	45	27.61%
4 Agree	61	37.42%
5 Strongly Agree	32	19.63%
Total	163	



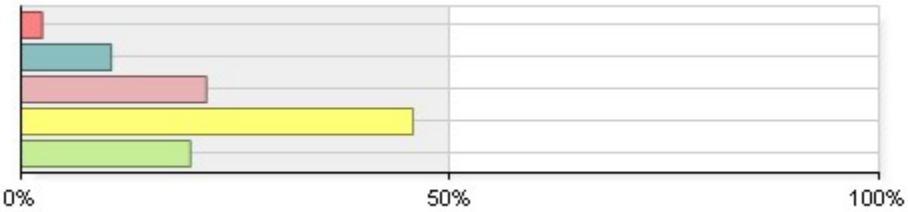
11. The Biology Program has provided me with opportunities to function effectively as a team member

1 Strongly Disagree	6	3.68%
2 Disagree	22	13.50%
3 Neutral	51	31.29%
4 Agree	56	34.36%
5 Strongly Agree	28	17.18%
Total	163	



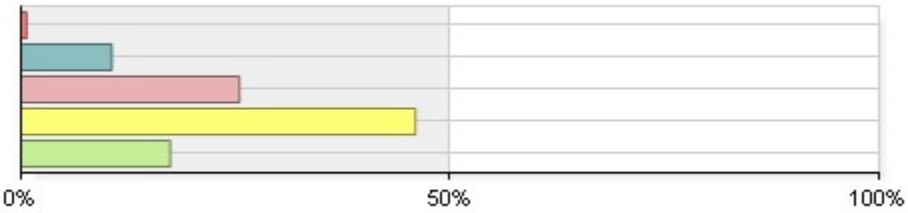
12. The Biology Program has provided me with adequate opportunities for exploring biological applications in a variety of settings

1 Strongly Disagree	4	2.47%
2 Disagree	17	10.49%
3 Neutral	35	21.60%
4 Agree	74	45.68%
5 Strongly Agree	32	19.75%
Total	162	



13. The Biology Program has helped me develop a strong sense of moral and ethical responsibilities as they relate to biology applications

1 Strongly Disagree	1	0.62%
2 Disagree	17	10.56%
3 Neutral	41	25.47%
4 Agree	74	45.96%
5 Strongly Agree	28	17.39%
Total	161	

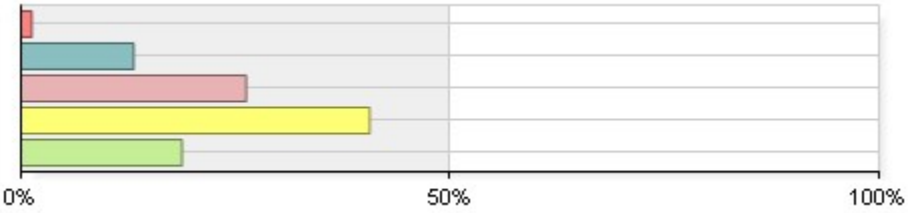


14. I have developed a clear understanding of fundamental biological theories, methods and concepts as a Biology student

1 Strongly Disagree	1	0.63%
2 Disagree	5	3.13%
3 Neutral	35	21.88%
4 Agree	72	45.00%
5 Strongly Agree	47	29.38%
Total	160	

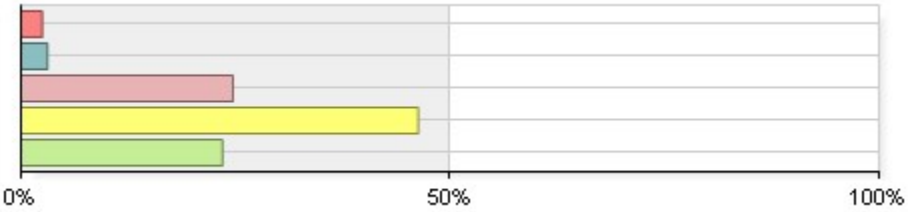
15. The Biology Program has provided me with opportunities to use technology as an aid in solving problems that I am likely to encounter as a professional

1 Strongly Disagree	2	1.25%
2 Disagree	21	13.13%
3 Neutral	42	26.25%
4 Agree	65	40.63%
5 Strongly Agree	30	18.75%
Total	160	



16. The Biology Program has prepared me with the skills necessary to serve as an effective professional or to pursue an advanced degree

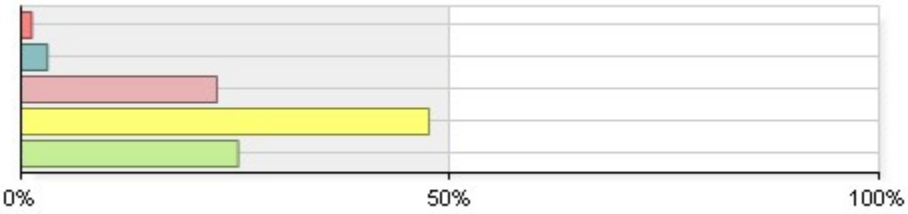
1 Strongly Disagree	4	2.47%
2 Disagree	5	3.09%
3 Neutral	40	24.69%
4 Agree	75	46.30%
5 Strongly Agree	38	23.46%
Total	162	



Please rate your agreement with the following as they relate to the Biology program in the College of Arts and Sciences: (continued)

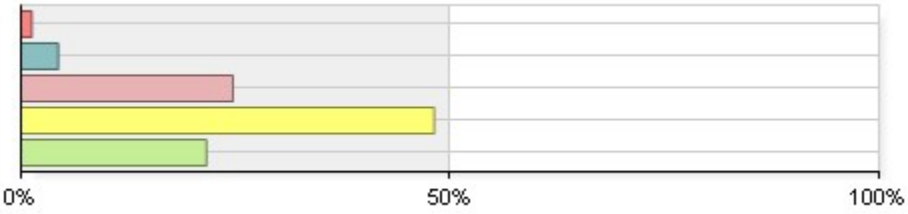
17. The Biology Program has exposed me to a deeper understanding of a variety of analytical methods

1 Strongly Disagree	2	1.23%
2 Disagree	5	3.09%
3 Neutral	37	22.84%
4 Agree	77	47.53%
5 Strongly Agree	41	25.31%
Total	162	



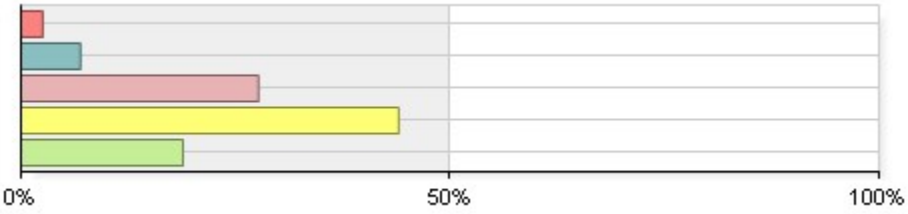
18. The Biology Program has taught me to construct and test hypotheses and theorems

1 Strongly Disagree	2	1.23%
2 Disagree	7	4.32%
3 Neutral	40	24.69%
4 Agree	78	48.15%
5 Strongly Agree	35	21.60%
Total	162	



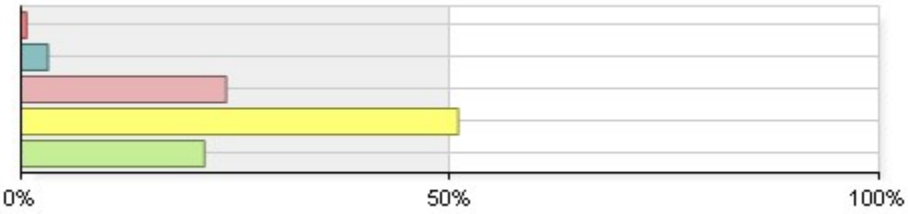
19. The Biology Program has taught me the laboratory skills essential for experimentation

1 Strongly Disagree	4	2.52%
2 Disagree	11	6.92%
3 Neutral	44	27.67%
4 Agree	70	44.03%
5 Strongly Agree	30	18.87%
Total	159	



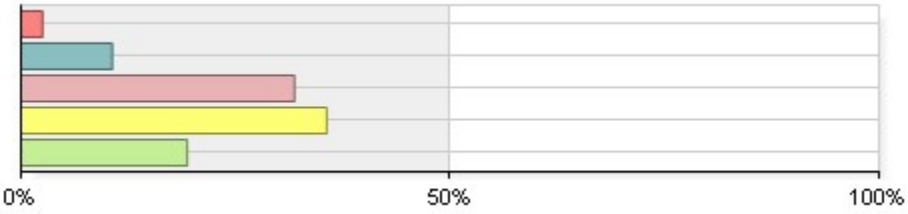
20. The Biology Program has taught me to analyze, understand and develop solutions to a variety of problems

1 Strongly Disagree	1	0.63%
2 Disagree	5	3.14%
3 Neutral	38	23.90%
4 Agree	81	50.94%
5 Strongly Agree	34	21.38%
Total	159	



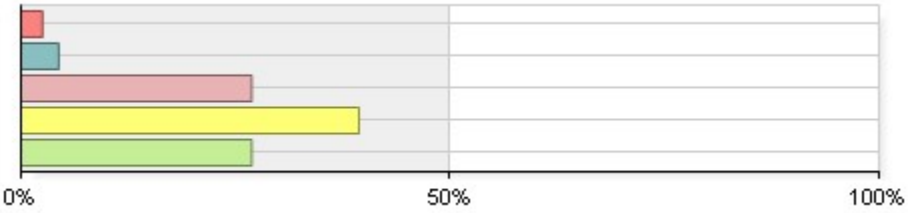
21. The Biology Program has provided me with opportunities to participate in research projects with faculty members

1 Strongly Disagree	4	2.50%
2 Disagree	17	10.63%
3 Neutral	51	31.87%
4 Agree	57	35.63%
5 Strongly Agree	31	19.38%
Total	160	



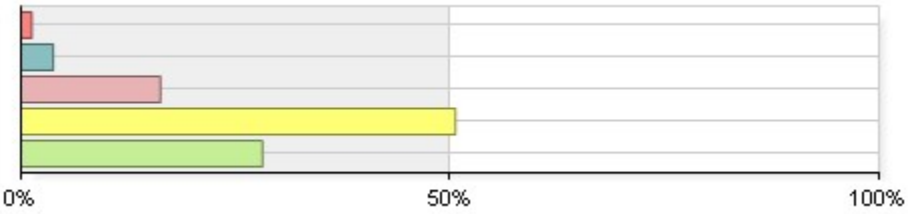
22. The Biology Program clearly articulated the need for lifelong learning in order for me to pursue a successful career

1 Strongly Disagree	4	2.50%
2 Disagree	7	4.38%
3 Neutral	43	26.88%
4 Agree	63	39.38%
5 Strongly Agree	43	26.88%
Total	160	



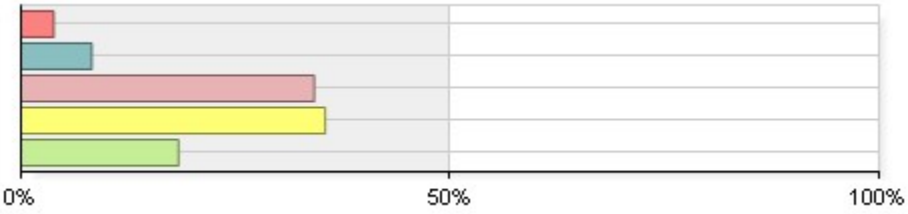
23. The Biology Program has exposed me to current issues and topics related to biology

1 Strongly Disagree	2	1.25%
2 Disagree	6	3.75%
3 Neutral	26	16.25%
4 Agree	81	50.63%
5 Strongly Agree	45	28.13%
Total	160	



24. The Biology Program has provided me with opportunities to explore solutions to improve the quality of life in my community

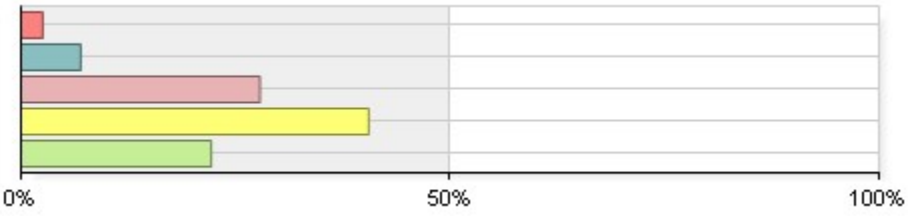
1 Strongly Disagree	6	3.80%
2 Disagree	13	8.23%
3 Neutral	54	34.18%
4 Agree	56	35.44%
5 Strongly Agree	29	18.35%
Total	158	



Please rate your agreement with the following as they relate to the Biology program in the College of Arts and Sciences: (continued)

25. I feel adequately prepared to function as a successful professional

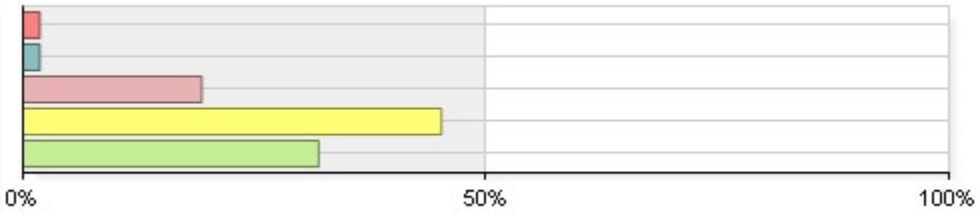
1 Strongly Disagree	4	2.53%
2 Disagree	11	6.96%
3 Neutral	44	27.85%
4 Agree	64	40.51%
5 Strongly Agree	35	22.15%
Total	158	



Overall Impression of the Program

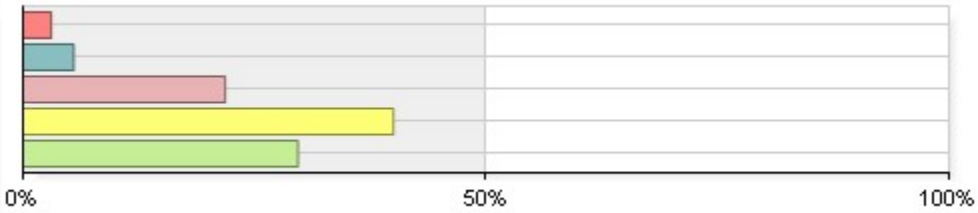
1. My overall impression of the Biology program

1 Very Poor	3	1.81%
2 Poor	3	1.81%
3 Neutral	32	19.28%
4 Good	75	45.18%
5 Very Good	53	31.93%
Total	166	



2. Likelihood that I would recommend the Biology program to a friend or family member

1 Very Poor	5	3.03%
2 Poor	9	5.45%
3 Neutral	36	21.82%
4 Good	66	40.00%
5 Very Good	49	29.70%
Total	165	



Additional Comments

Comment
1. I think professors should have more office hours to talk and interact with their students. One or two hours of office hours a week is not enough time sometimes for a classroom of a hundred students. I am also really disappointed that most Biology professors just read the Power points and do not really teach their students. We pass most of our classes but all we do is memorize slides, and that in my opinion is not an effective learning method.I think professors should also care more about their students and show respect to them.
2. The professors in the Biology program are very helpful to only a certain select of students.
3. I haven't taken any Biology courses. I changed my major to English.
4. I have changed my major to Liberal Studies.
5. Some of the above questions were not very applicable to me or I feel that I could not answer them honestly due to my lack of experience in the Biology Program. I am only a freshman and am enrolled in one biology class. I have not yet had the labs and stuff.
6. Nobody cares about diversity, etc and I'd like to keep it that way. How about just teaching the material and not worrying about that BS? My only complaint with the biology department is the building itself. The business school has an amazing facility with a ton of study rooms that are only used by Biology majors because: A) Business students don't study B)There are no study rooms (or even nice couches) in the biology building.
7. As a senior i have taken all of the Biology core classes and many of the electives at this point. One huge problem that I saw repeatedly as i progressed through my degree program was an abuse of curves in courses.

This problem is much worse for classes like organic chemistry, but professors will often teach courses/give exams in a way that leads to a majority of the class scoring below 70%. Test averages this low are often just put in the past with a large curve to boost averages. The issue remains that the students ARE NOT LEARNING the material if most of the class would be failing without the curve. I have seen this in upper and lower level courses specifically in biology and chemistry. To add insult to injury many professors will blame classes of 100 or more for all being lazy as the cause of low test scores instead or looking at how they teach the material.

This issue needs to be addressed or students will continue to move past courses that are badly taught, or too difficult at the level presented without learning the material.

8. Biology 244 is a joke. Seriously. Just looking at the manual for it will make you laugh. Everything is spelled wrong. There is a ridiculously large amount of material that is extra that is not even covered in lab because we don't have the resources to do it. The lab consists of memorizing more material than anyone can memorize and going to lab to look at diagrams because we cannot even complete the lab ourselves.

9. My experience is wonderful here every body is nice.

10. I'm not even majoring in Biology anymore, I've switched to French.

11. I have changed my major, so the biology questions no longer apply. I have not gone to A&S advising, I utilize the honors program's services.

12. I don't necessarily have a problem with the quality of the program, but rather with the advising staff. I am an honors student, however, when I went into Gardiner Hall with a question specifically regarding biology as a major, they were unable to answer it and I had to set up an appointment with my honors advisor to get it answered. Eventually my problem was solved, however any other time I have been in Gardiner Hall, they have also been unable to answer what I would think to be simple questions that should not require an advising appointment.

13. My advisor left halfway through the summer, and I haven't received any information as to who my new advisor is. I even went and asked about it and the person said that they couldn't give me any information.

14. Jjj

15. As I said before, classes should be available more often. Also, when they are available, if only one section will be opened it should not intersect other required classes that also only have one section.

16. The Gen Ed requirements of the College of Arts and Sciences need to be changed.More CLEP tests should be accepted in lieu of most of the requirements especially history.International students should be exempted from the CD requirements.Consider the fact that many international students have not had these "gen ed" style coursework before.UL has to do something that would be more inclusive for these individuals.This would in some way promote diversity.The Chemistry department should also support diversity more.

17. I want to say thank you to Dr. Fell for believing in me and for helping me out during my undergraduate career. He has been a great advisor and mentor, and I can't wait to take his Histology class next fall to end my biology degree on a great note.

18. The teachers make it great

19. You offer related classes at the same time once per year!!!!!! Are trying to make your selves look like a more difficult program because fewer students manage to graduate in 4 years? Are you trying to diminish the overall quality of your program? I went to pick up an independent study form and the person in the office was so rude it bordered on yelling, and she accused me of trying not to pay for classes. I have paid $40,000 for my degree, that's embarrassing for your department. My Biology professors have been nothing but excellent. The supporting staff for your department is reducing the value of this course of study as a UofL student. I am now taking courses not applicable to my field because of the way your department decided to list courses. It is a very sad day for a Biology department when the student going in to healthcare has been forced to take Ecology, and Evolution classes in order to graduate. Let me be clear I do not fall in to the category of uninvolved or unmotivated to learn the entire field in anyway. I could have graduated a year ago, I stayed in hopes of gaining more knowledge and experience before graduate school. That occurred in my other program but not this program. I seriously doubt that I have adequately conveyed my anger, frustration, and overall disgust with the fact that I attend a school with incredible Biology professors but I will not be gaining the knowledge I need from them, because of a lack of organization. Please, please fix your course offerings students that work hard enough to get to senior year in a science program should never have to confront this problem.

20. N/a

21. It's all new to me, meaning that having a really big class is new to me. Sometimes I can't exactly pay attention due to a group of students talking in the back. The SI sessions are not really helping because the student that teaches us is not from the Biology class that I am in, and if that student has never had the same teacher as us how can she teach us the lesson or how can she break the lesson for us to understand? In order for us to fully

understand we also need the upperclassman to be from the same teacher or at least had the same teacher for a while now.
Thank You

22. I don't feel there is a need to put such emphasis on diversity.
There are many honors seminars that are quite relevant to the field of biology; they should be available as biology electives.

23. Dr. Fell is one of the best professors that I have had at this University and at any of my academic institutions. His knowledge and love for his field is evident in all of his classes. His classes are VERY tough, but I have never felt like I learned more or more prepared for my future career path as I did when I left his classroom.

24. If U of L had a science facility closer to my home, with available courses and a variety of scheduling, I feel that my academic career would be much more enjoyable and I could live up to my full potential. Instead, I am currently spending more time in my car on the way to and from school than I am at school. This is a major problem for me. Online classes should not cost 30% more than on campus classes, this only puts people such as myself at an even further disadvantage! I loved school before coming to U of L, now it is just something I am trying to get through successfully.

25. My suggestions include offering more Biology classes in the evenings. If you offer a class in the evening it is also likely there will be students who work full time during the day. In that case, instructors who offer courses in the evenings should have similar times for office hours. It does not make sense to have office hours only during the day for a night class. I am very displeased with this aspect of the college. Also, there is a great market for online classes. That being said, a lot of the lectures can and should be made available on line. You would attract more students who need a more flexible schedule to be able to complete their college courses. Thank you for allowing the opportunity to share my opinion.

26. I have yet to really start the Biology program because I can't get the classes I need!

27. I have yet to even meet the Biology faculty other than my professors. My adviser emailed me once about an advising appointment, but never emailed me back after i sent them four emails. I'm going to Gardiner Hall today to demand an appointment. I, however, don't have a problem with the classes or professors.

28. For gen ed purposes, students should be allowed to take HIST 201, American History. I personally am more interested in American History and would have done somewhat better in it as opposed to world history. There should also be an anatomy course for biology majors instead of one specifically for nursing majors.

29. The addition of required co-op to graduate would be excellent and extremely beneficial for students. Graduating with a degree in biology is not enough to proceed toward a career in the medical field. Experience would be a great push and guarantee work/acceptance into a graduate program. Be it shadowing a person in the medical field or co-op in a hospital, having experience being mandatory for a degree (a la the speed school program) would actually impact those who want a career in the medical field.

Biology Specific Assessment

The Biology assessment that was developed at U of L was not part of the gen ed assessment for natural sciences. The assessment was set up by the Biology department as a way of evaluating our own curriculum to determine if our students were learning what we thought they should be learning and to give us an idea of how that learning "should be" increasing as the student progresses through their program of study.

We wanted something quick and easy to administer so it would minimize faculty time. Blackboard had not been used for such a purpose in the past but turned out to be the best option. We set up 4 assessment "Organizations" within blackboard rather than courses. Students are enrolled into the specific Organization and contacted through the Blackboard email system that they should be able to see the assessment. This is voluntary, however, we get very good responses from our incoming freshmen and graduating seniors without putting an absolute requirement to take the assessment.

The assessment questions were developed by faculty that teach our majors introductory series. They basically took questions from their own exams in those first year courses and tried to distribute the questions over 10 major areas:

- Animals
- Plants
- Cell
- DNA
- Ecology
- Evolution
- Genetics
- Scientific Method
- Taxonomy
- Animal Form and Function

There are roughly 15 questions +/- in each of the ten groups. Blackboard randomly selects three questions from each pool and provides a 30 question exam that is restricted to 30 minutes. Before students start the assessment, they are asked to complete a survey of 4-5 questions. The survey gives us information about whether the students had an AP Biology class in high school, checks on their intended major, asks them if they are a transfer student, etc. The survey section is easily modified to give us any information we'd like.

The assessment exam is given to new incoming freshmen enrolled in our first majors course during the start of the fall semester, Biology 240. The second time students are asked to take the assessment is at the end of their first year, so at the end of Biology 242. The third time they are asked to take it is at the end of the second year, during their Genetics course 330. Most students on track will have finished the core of Biology courses and are ready for electives. Our 19 hour core is:

- 240 Unity of Life
- 242 Diversity of Life
- 244 Principles of Biology Lab
- 330 Genetics & Molecular Biology
- 331 Genetics & Molecular Biology Lab
- 363 Principles of Ecology

The fourth time students are asked to take the exam is the end of their last semester, just before graduation.

Average scores on the exam for new incoming freshmen is around 10 and increases to 15-16 after the first year. The scores on the third exam are more variable but tend to hit 20-22. When we first started this assessment there was little change between the scores on the third and last exam, however, our graduating students are doing better on it and will tend to average 24-26. We thought after the core, a reason student scores weren't increasing was because students tend to take upper level electives in a more concentrated area and forget some of their more introductory material. This doesn't appear to be the case any longer and for most students we see an increase in scores each time it is taken. Remember, the questions are randomized so there are at least some different questions each time it is taken.

The results of this type of assessment have been very positive with regards to evaluating our own curriculum and assessment of student learning outcomes. At the urging of the Admissions office, we have recently begun to use it as a placement exam to help guide incoming freshmen either to the general education biology course for non-majors or directly into the majors Biology 240 class. Since we started using it as a placement exam two years ago we now use it as a major screening tool. In order for a student to get into the first majors course as an incoming first year student they need:

- An ACT science score of 24 or higher, or they can take the assessment and need a score of 10/30 or better. Without one or the other, the students are placed in Biology 102, the general education Biology course.

The next step in the evolution of this assessment was to use it for transfer students. This has become more important as better institutional research data has become available. Of the students graduating from Biology each year, approximately 25% are transfer students that never took our first or second year core courses. We wanted to know if these students are coming in with the expected learning outcomes accomplished at their first institution. So just as the assessment is used as a placement exam, we have started using it as a transfer student placement assessment. Results from ECTC, Big Sandy, and JCTC all show similar entering scores and improvements in these scores after their first year of Biology courses. A take home message from a small number of transfer students at this point indicates that if transfer students come in with a year of Biology from KCTCS, they should be able to move forward in the Biology curriculum without problems. Transfer students problems do not appear to be correlated with content knowledge insufficiency.