PROPOSAL FOR NEW UNDERGRADUATE PROGRAM

University of Louisville
Institution Submitting Proposal

Bachelor of Science
Degree Designation as on Diploma

Bachelor of Science in Neuroscience
Title of Proposed Degree Program

EEO Status	
CIP Code	
Academic Unit (e.g. Department, Division, School)	Department
Name of Academic Unit	Psychological and Brain Sciences/Anatomical Sciences and Neurobiology
Name of Program Director	Paul DeMarco, Ph.D. and William Guido, Ph.D.
Intended Date of Implementation	Fall 2018
Anticipated Date for Granting First Degrees	May 2022
Date of Governing Board Approval	
Name, Title and Information of Contact Person	Paul DeMarco, Ph.D. Professor Psychological and Brain Sciences (502) 852-0788 paul.demarco@louisville.edu

---

Date of CPE Approval

Evaluation Criteria

All actions in the approval of new programs for public institutions are subject to a stipulation regarding the program's ability to attain specified goals that have been established by the institution and approved by the Council on Postsecondary Education (the Council). At the conclusion of an appropriate period of time, the program's performance shall be reviewed by Council staff following criteria established in the Council's Academic Programs Policy.

A. Centrality to the Institution's Mission and Consistency with State's Goals

A program will adhere to the role and scope of the institution as set forth in its mission statement and as complemented by the institution's strategic plan.

1. **List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.**

   The Department of Anatomical Sciences and Neurobiology and the Department of Psychological and Brain Sciences propose to collaborate to create a new Bachelor of Science in Neuroscience degree at the University of Louisville. The discipline of neuroscience has grown very quickly since the formation of the Society for Neuroscience in 1969. Much of the rapid growth in the field has been driven by advances in technology, which have provided insight into the structural and functional underpinnings of the nervous system and its relationship to human behavior. The allure to understand this relationship has driven significant growth in neuroscience research. In 2013, President Barack Obama announced the BRAIN initiative (**B**rain **R**esearch Through **A**dvancing **I**nnovative **N**eurotechnologies). It is a multi-agency effort to fund research to "… revolutionize our understanding of the human mind and uncover new ways to treat, prevent, and cure brain disorders like Alzheimer's, schizophrenia, autism, epilepsy, and traumatic brain injury." The field of neuroscience also reaches into the broader areas of economics, robotics, artificial intelligence and technological development, such as virtual reality systems. These lofty goals critically depend upon the training of future neuroscience scholars, as underscored by the federal government's support of research aiming to elucidate the function of the human brain and nervous system disorders. This training starts at the undergraduate level, where many institutes of higher education have met the need for training in the neurosciences by creating bachelor's programs in neuroscience.

   The proposed Bachelor of Science in Neuroscience (BS in Neuroscience) is an interdisciplinary degree with a STEM-Health focus. Graduates of the program will be trained to critically assess and analyze ideas and concepts from the diverse disciplines that contribute to the field of neuroscience. Ultimately providing our graduates the skills and training necessary to understand the relationship between the nervous system, our behavior and our health. Students will achieve an in-depth understanding of nervous system function, from the molecular level to the cognitive sciences, and become familiar with the techniques used to measure nervous system function from the cellular level to the whole brain. Furthermore, students will be exposed to current and developing methods used to mitigate or restore functional loss in individuals with nervous system damage or disease. Through mentored research experiences, students will learn to critically assess the neuroscience literature and understand the methodology used to measure the structure and function of the nervous system. Graduates of this program will be poised for careers in a wide variety of

areas, including neuroscience and health-related fields, the social sciences, and the biological sciences. Additionally, this program will well prepare students for post-graduate study in graduate school and professional degree programs.

2. Explain how the proposed program relates to the institutional mission and strategic plan.

Establishing a BS in Neuroscience will address a number of goals outlined the University's Strategic "2020 Plan" and in the "21st Century Initiative". Specifically, as related to the relevant aspirational goals stated in these initiatives, the BS in Neuroscience will:

2020 Plan

1. "Increase the degree-seeking FTE freshman…by attracting the best students in KY to UofL."
2. "Increase the number of BA/BS degrees awarded…by 2020."
3. "Involve all undergraduates in a research, community, or applied project."
4. "Implement STEM initiatives leading to more graduates with science, technology and mathematics majors…".

21st Century Initiative

1. Increase undergraduate research opportunities: "Integrate research experience in undergraduate curricula"
2. Revenue Enhancement: "Strategically grow enrollment in high demand fields".

In addition to these university-wide goals, the degree will also address several goals outlined the **College of Arts and Sciences "Strategic Plan 2007-2020"**:

1. Improve the quality, diversity, depth and breadth of A&S academic programs by: "adding, selectively and strategically, new academic programs…."
2. Expand research capacity and increase research productivity in all divisions of the College: "Increase the number of A&S students engaging in undergraduate research by 200%".

3. Explain how the proposed program addresses the state's postsecondary education strategic agenda.

The Kentucky Council on Postsecondary Education (CPE) published an updated strategic agenda titled "Stronger by Degrees: The 2016-2021 Strategic Agenda for Postsecondary and Adult Education". A major goal of this new plan is to "raise Kentucky's educational attainment level to 58 percent by the year 2025, up from its current level of 45 percent." The CPE articulates a number of goals for post-secondary education, and many of these goals are addressed by the proposed program. For example, one of the CPE's objectives is to "Improve the career readiness and employability of postsecondary education graduates" and to "Advance Kentucky's STEM and health agendas…". The proposed degree program will prepare students for many potential career paths, many of which will be in STEM and health fields. Many STEM/Health jobs are high paying, particularly those in professional fields, and the CPE recognizes that "highly-educated people create additional savings from lower costs in health, unemployment, public assistance, and crime." Students who pursue

health-related fields and stay in Kentucky will, in turn, help to address the health care and societal burdens that are prevalent in many regions of Kentucky. We will track alumni of this program to follow their career paths as an outcome measure for the degree.

Advances in outreach and interventions to address the needs of Kentucky's citizens often arise from basic and applied research. The CPE acknowledges the importance of this research and charges universities to "increase undergraduates' involvement in research to improve their analytical and critical thinking skills, increase student engagement, and train future researchers and academicians." The proposed degree program has explicit learning objectives to acquaint students with research in the field of neuroscience, train students in the fundamentals of statistical analyses and research design, and require students to participate in a mentored research experience with faculty members in the discipline. These program guidelines will challenge students with analytical thinking exercises, train students to evaluate literature through a critical lens, and introduce them to the methodologies used in neuroscience research. The CPE encourages faculty members to "receive ongoing training and development to ensure they are effectively incorporating new technological innovations and the most effective pedagogical practices." Many of the faculty on record for the program actively participate and collaborate with UofL"s Delphi Center for Teaching and Learning to stay abreast of current pedagogical best practices and instructional technologies. In this context, we are actively exploring how neuroanatomy instruction can be facilitated and enhanced by using the newly opened **Teaching Innovation Learning Laboratory** (TILL) in Ekstrom Library.

In sum, the proposed BS in Neuroscience directly address several important educational goals as outlined in the current Statewide Postsecondary Agenda.

4. Explain how the proposed program furthers the statewide implementation plan.

The statewide implementation plan, previously a separate document, has now been incorporated as a subsection in the newly published "Stronger by Degrees: 2016-2021". The implementation plan focuses mainly on promoting a legislative agenda to support postsecondary education through various funding initiatives, including creating a new Outcome-Based Funding Plan. UofL's strategic plan will need to address the outcome-based funding metrics once they are finalized. While the current degree program aligns with several goals in UofL's current Strategic Plan as outline above, the faculty will stay alert to future changes in the university's strategic plan to assure that the BS in Neuroscience remains aligned with the university's goals.

B. Program Quality and Student Success

The curriculum should be structured to meet the stated objectives and student learning outcomes of the program.

1. **List all student learning outcomes of the program.**
   a. Demonstrate a broad foundation in the concepts and methodologies of the interdisciplinary field of neuroscience at the cellular, molecular, systems, cognitive and behavioral levels (provided broadly by core and elective coursework in Anatomical Sciences and Neurobiology and Psychological and Brain Sciences).

b. Demonstrate an understanding of the scientific process using quantitative approaches and critical reasoning, including developing hypotheses, evaluating and analyzing data, and interpreting results. (obtained in core courses, but also from statistical and experimental design courses: Psyc 301 and Psyc 301 and in required mentored research experiences).

c. Clearly communicate results of scientific studies, or of a proposed experimental designs, in standard formats for the discipline. (taught broadly in core courses, and targeted specifically in WR courses taken in the degree and through mentored research).

d. Recognize the practical implications of neuroscience to improving human health and quality of life, and understand the ethical issues that apply to neuroscience research. (emphasized in core neuroscience and seminar courses, as well through exposure to neuroscience research areas)

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

As a co-directed degree overseen by faculty from two departments (Psychological and Brain Sciences, and Anatomical Sciences and Neurobiology), students will receive broad-based training in liberal arts concomitant with a specialized sequence of courses in the social sciences, natural sciences and biological sciences. A fundamental goal of the degree program is to provide students with a foundation in the biological, health and social sciences to prepare them for careers in these fields. As students progress to higher-division course work, the curriculum becomes more focused in the discipline of neuroscience, providing them with training in basic nerve cell function, neural networks and brain-behavior relationships, including psychiatric/psychological disorders. Through coursework and mentored research experiences, students will learn statistical and experimental methodology, as well as, methods specific to neuroscience research. These lessons will be further enhanced by working with a faculty mentor for at least one semester on laboratory research or in a directed readings project focused on a particular research question. Through elective courses, students will have an opportunity to concentrate their studies in areas of personal interest.

3. Highlight any distinctive qualities of this proposed program.

The joint administration of the program by the two participating departments establishes a new opportunity for collaboration in undergraduate education between the College of Arts and Sciences and the School of Medicine. Students in this program may also take relevant elective courses from the School of Public Health, School of Engineering and School of Business. There is a strong neuroscience community at the University of Louisville. Currently, there are at least 43 faculty across the campus whose research is linked to the discipline of neuroscience. Including faculty with appointments in the College of Arts and Science, the College of Education and Human Development, the School of Medicine and the Speed School of Engineering. Faculty labs will provide experiential learning environments for students, which are augmented by faculty affiliations with the following

centers and institutes: Center for Environmental Genomics and Integrative Biology, Center for Genetics and Molecular Medicine, Depression Center, Gheens Center for Research on Aging and Age-Related Diseases, Institute for Sustainable Health & Optimal Aging, Kentucky Lions Eye Center, Kentucky Spinal Cord Injury Research Center and the Neurosurgical Institute of Kentucky. This community provides a rich and diverse training ground for students who major in neuroscience and is a testament to the interdisciplinary nature of the field.

4. **Will this program replace or enhance any existing program(s) or track(s) within an existing program?**
    - **If yes, please specify. Include the projected faculty/student in major ratio.**

    There is no plan for this degree to replace any existing degree programs.

Is there a specialized accrediting agency related to this program?

There are no special accreditation requirements for this program, but the Society for Neuroscience serves as a long-standing professional society for the discipline, disseminating research via an annual national conference and supplying resources for both graduate and undergraduate education. There is also a local (Louisville) chapter of the organization which holds an annual Neuroscience Day meeting, bringing internationally renowned speakers and showcasing both undergraduate and graduate research. Students and faculty from around the state and region are invited to attend this annual event.

a. **If yes, identify the agency.**
b. **Do you plan to seek accreditation?**
c. **If yes, explain your plans for accreditation. If no, explain your rationale for not seeking accreditation.**

5. **Attach the SACS Faculty Roster Form. Faculty resources shall be demonstrated to be adequate and appropriate for the proposed program. The number of faculty should meet external standards where appropriate. The qualifications of faculty will support the objectives and curriculum of the proposed program.**

6. **Access to the qualitative and quantitative library resources must be appropriate for the proposed program and should meet recognized standards for study at a particular level or in a particular field where such standards are available. Adequacy of electronic access, library facilities, and human resources to service the proposed program in terms of students and faculty will be considered. Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs.**
    a. **Describe the library resources available to support this program. You may attach any documentation provided to SACS.** A letter of support from the University Libraries is attached.
    b. **Describe the physical facilities and instructional equipment available to support this program.** Classroom and laboratory space are sufficient and state of the art.

Most classrooms have instructional computers and multimedia projection capabilities. The Delphi Center opened the new Teaching Innovation Learning Lab (TILL) in 2016 that supports advanced teaching innovations and small group learning (http://louisville.edu/till). A new Belknap Academic Building will open Fall, 2018 that will house 17 new technology-enhanced classrooms, in addition to student study spaces, gathering areas and food service facilities.

7. Clearly state the admission, retention, and completion standards designed to encourage high quality.

While this program is co-directed by faculty from the Health Sciences and Belknap Campuses, students will matriculate in the College of Arts and Sciences and therefore will need to meet the standard admissions requirements of the university and the college.

Requirements for admission to the Major:

1. Complete Psyc 201 (Introduction to Psychology or equivalent transfer credit) and Psyc 443 (Introduction to Neuroscience) earning a grade of C or higher.

2. Complete Statistics Requirement (Psyc 301 or Biol 350), earning a grade of C or higher. Completion of Math 205 (Calculus I) is required for the degree. For admission to the major, students must have completed the necessary math coursework, or have a math placement score, to satisfy the prerequisites to enroll in Math 205.
3. Have an overall cumulative GPA of at least 2.5 (note: no grades of C- or lower in core or supporting coursework may be counted toward requirements for the major).
4. Have completed at least 30 hours of degree-applicable credit.

Other Completion Requirements:

1. Students must participate in at least 3 hours of a research experience, which may include independent research or directed readings with a neuroscience faculty mentor (see attached list of potential neuroscience faculty mentors across the university).
2. Students must complete at least 122 credit hours to graduate.

Students may apply for admission to the major as early as their sophomore year. One faculty member from each of the participating departments will act as co-program directors and divide the duties to monitor student progress and assist students with required research placements with neuroscience mentors. After students are admitted to the major, students will be advised by the faculty co-directors and by the professional student advisor currently in the Department of Psychological and Brain Sciences. Students' career interests will be assessed, and students will be advised on appropriate electives to prepare them for specific career paths (eg, students who wish to apply to medical or dental school will be advised to take the Organic Chemistry and Biochemistry sequences). Curriculum electives by students will be tailored Any students whose academic standing is at risk before they are admitted to the major will be identified by the College of Arts and Sciences Advising Office. The co-directors will work with the advising office and the REACH office to assist those students

with a remediation plan, or to discuss with them whether their choice of major is appropriate.

a. **Indicate expected faculty to student ratio:**
There are 26 participating faculty across two departments who are listed on the SACS Faculty Roster Form. By the fifth year of the program, we predict 130 students will either have declared the major of have expressed intent on declaring the major. This establishes a student to faculty ratio of about 5:1, but this ratio is somewhat low because many of the courses required for the degree also enroll students from other degree programs.

8. **Clearly state the degree completion requirements for the program.**
Students must meet the degree requirements established by the College of Arts and Sciences. For the major, students must complete the programmatic and university general education curriculum, and complete at least 122 credit hours to graduate. For this major, students will be required to participate in at least 3 hours of a research experience with a neuroscience faculty member.

9. **Provide the following information for the program and for each concentration (some categories may not apply to all programs):**
   a. **Total number of hours required for degree:** 122-125
   b. **Number of hours in degree program core:** 33 in the core, plus 25 in required supporting courses which are part of the recommended pre-med sequence
   c. **Number of hours in concentration:** no concentration tracks are proposed
   d. **Number of hours in guided electives:** 0
   e. **Number of hours in free electives:** 33

10. **Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions. Attach all draft articulation agreements related to this proposed program.**

11. **List courses under the appropriate curricular headings.**

Core Courses			
Prefix & Number	**Course Title**	**Credit Hours**	**New**
PSYC 201	Intro to Psychology	3	N
PSYC 301	Quantitative Methods in Psychology (or BIOL 350)	3	N
PSYC 302	Experimental Psychology	3	N
PSYC 331	Sensation and Perception	3	N
PSYC 422	Introduction to Cognitive Neuroscience	3	N
BIOL 329	Cellular and Molecular Biology or BE 359	3	N
PSYC 443 (343)	Introduction to Neuroscience	3	N*
BIOL 465	Principles of Physiology or BE 354	3	N
NSCI 400	Directed research (CUE) or NSCI 401 Directed research-	3	Y

	(CUE/WR)		
ASNB/NSCI 502	Fundamentals of Neuroscience	3	N*
	Students must select 1 of the following:		
ASNB 617	Seminar on Developmental Neurobiology	3	Y*
ASNB 666	Synaptic Organization of the Central Nervous System	3	Y*
Required Supporting Courses			
BIOL 240	Unity of Life	3	N
BIOL 242	Diversity of Life	3	N
BIOL 244	Principles of Biology Lab	1	N
MATH 205	Calculus I	4	N
CHEM 201	General Chemistry I	3	N
CHEM 202	General Chemistry II	3	N
CHEM 207	Introduction to Chemical Analysis I	1	N
CHEM 208	Introduction to Chemical Analysis II	1	N
CHEM 209	Introduction to Chemical Analysis III	1	N
PHYS 221	Fundamentals of Physics I	3	N
PHYS 222	Fundamentals of Physics II	3	N
PHYS 223	Fundamentals of Physics Lab I	1	N
PHYS 224	Fundamentals of Physics Lab II	1	N
Suggested Electives (not an exclusive list)			
BIOL 330	Genetics and Molecular Biol	3	N
BIOL 331	Genetics and Molecular Biology Lab	1	N
BIOL 415-WR	Biology of the Cell	3	N
BIOL 511	Behavioral Endocrinology	3	N
BIOL 540	Intermediary Metabolism	3	N
CHEM 341	Organic Chemistry I	3	N
CHEM 343	Organic Chemistry I Lab	2	N
CHEM 342	Organic Chemistry II	3	N
CHEM 344	Organic Chemistry II Lab	2	N
CHEM 545	Biochemistry I	3	N
NSCI 406	Honors directed research-WR	3	Y
PHIL 536	Philosophy of Science	3	N
PHIL 580	Foundations of Bioethics	3	N
PHIL 581	Current Controversies in Health Care Ethics	3	N
PSYC 322	Cognitive Processes	3	N
PSYC 344	Physiological Psychology	3	N
PSYC 363	Lifespan Developmental Psychology	3	N
PSYC 365	Child Development	3	N
PSYC 385	Abnormal Psychology	3	N
PSYC 5xx	Intro to Neuroimaging Analysis	3	Y**

PSYC 5xx	Functional Neuroanatomy	3	Y**
ASNB 614	Molecular Neuroscience	3	Y*

Legend:
Y*- 500 level section will be created to coincide with existing 600 level graduate course. These courses may have a new prefix to designate them as part of the neuroscience bachelor's program (eg ASNB 617/NSCI – 517. ASNB courses will be cross-listed with NSCI courses when appropriate).
Y- Course previously offered as a seminar but will offered as a standing course.**
N*-Psyc 443 currently exists as a WR course but will be converted to a 300-level, non-WR, course to accommodate the increased enrollment demand as a required core course.

12. **Describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.**
    The instructional delivery method for the degree program will be primarily through traditional "face-to-face" teaching. However, there may be occasional courses that are appropriate for the program offered in alternative formats (e.g., online learning). Faculty will incorporate current advances in technological instruction when appropriate, such as the use of "clickers", multimedia instructional videos or animations, adaptive learning and quizzing technologies and social media discussion groups or blogs. The University of Louisville, through the Delphi Center for Teaching and Learning, offers numerous professional development opportunities for instructors to add new and innovative approaches to their practice of teaching. A recent addition to the Delphi Center is the **Teaching Innovation Learning Laboratory** (TILL). This space provides an experimental laboratory for testing new pedagogical methods and for weaving new instructional technologies into the curriculum. We envision the TILL as a resource for instructors who wish to pilot new delivery methods for teaching neuroscience, such as integrating new graphical technologies for teaching brain anatomy or forming digitally interactive student groups that will work to collectively solve critical thinking exercises in neuroscience. As earlier, there is also a new instructional building under construction on the Belknap campus which that will incorporate many of the state of the art instructional technology feature and classroom spaces that encourage use of active learning pedagogy.

C. Program Demand/Unnecessary Duplication

Proposed programs must respond to the needs of the academy and to larger economic and social environments. Thus, the institution must demonstrate demand for the proposed program. All proposed programs must address student demand. Programs must also address either employer demand or academic disciplinary needs.

1. **Student Demand: Clearly describe all evidence of student demand, typically in the form of surveys of potential students and/or enrollments in related programs at the institution.**
    a. **Provide evidence of student demand at the regional, state, and national levels.**
    Neuroscience training programs at the undergraduate level have experienced rapid growth in the past 30 years (Ramos et al, 2011). Fewer than 10 undergraduate

neuroscience programs existed in 1986. By 2008 the number had increased by a factor of 10, to over 100 programs at four-year institutions. Recent data from the National Center for Education Statistics (https://nces.ed.gov) shows there are now 156 undergraduate bachelor's programs in place at four-year institutions in the United States. This growth trend follows national interest in the neuroscience discipline, as well as, the undergraduate demand for study of the field. It is important to note that of the 156 programs nationwide, only 34 are at public institutions. Adding UofL to the list of institutions that offer a neuroscience degree will further the availability of affordable undergraduate neuroscience training programs and increase enrollment, as seen in these programs nationwide.

Overall, enrollment in regional neuroscience programs is robust. For example, the University of Cincinnati has three neuroscience tracks within the bachelor's program at the main campus, and total headcount across these tracks in 2015 was 248 students (University of Cincinnati, Office of Institutional Research). The University of Alabama, Birmingham (UAB), which is a CPE benchmark school for UofL with similar size and urban location, also has a successful neuroscience major which began in 2009. As reported by UAB's neuroscience program director Dr. Christin Gavin, enrollment as of Spring 2016 was 136 students, and 76 incoming freshman in the Fall 2016 class declared neuroscience as their major. Close to 40 students graduated from the major in the 2016 academic year. Dr. Gavin reported program growth was about 20% per year for the first 5 years of the program. Since program inception, 58% of graduates attended medical school, 30% attended graduate or other professional schools, and 12% pursued careers or study in other areas. Dr. Gavin reports that the popularity of the degree is putting strain on instructional capacity, and the faculty are considering increasing the rigor of admissions standards as a means of slowing growth in the program.

We have also taken a census of the UofL benchmark schools that offer undergraduate neuroscience training programs. Fifty-two percent (9 of 17) of UofL's CPE benchmark schools offer degree programs related to neuroscience (http://louisville.edu/finance/vpfinance/benchmarks). And while the schools of the Atlantic Coast Conference (ACC) are not official benchmarks for UofL, the university has become more involved in academic collaborations and meetings with the schools, and it's worthwhile to note that sixty-nine percent (9 of 13, not including UofL) of the ACC schools offer undergraduate neuroscience programs.

In the state of Kentucky, there are three institutions that offer a bachelor's degree in Neuroscience: Morehead State, Transylvania University and the University of Kentucky (UK). The neuroscience programs at Morehead and Transylvania are administered through the departments of psychology, whereas the program at UK is jointly administered through the departments of Biology, Anatomy and Neurobiology and Psychology. We spoke at length with Dr. James Geddes, co-director of the new undergraduate neuroscience program at the University of Kentucky. Similar to our proposed program, their program spans key topics in neuroscience, and offers students opportunities to work in labs with a focus in neural trauma and neurodegenerative disease. According to Dr. Geddes, the program is in its first year and is a success. UK's Office of Institutional Research

and Analytics website (http://www.uky.edu/iraa/enrollment-demographics) reports 163 students declared neuroscience as their major during the 2016-2017 academic year. Dr. Geddes anticipates rapid growth over the next several years, and asserts there is an extremely high demand for such programs throughout the Commonwealth and that similar programs are greatly needed, especially if neuroscience majors elect to have laboratory-based interactions. Dr. Geddes is open to discussion of possible collaborations, such as providing research experiences for students between the campuses, once the UofL program is approved. He also offered his full support and counsel for administering the program once it is in place.

In terms of local student interest at UofL, we surveyed 784 students in Introduction to Psychology (Psyc 201) at UofL over 2 semesters in the 2015-2016 academic year, to assess potential interest in a neuroscience degree program. This course serves as a General Education Social Science elective, and enrolls a wide variety of student majors. The survey was given to students after 6 lectures on psychobiology and neuroscience. The main survey question, along with the number of students responding to each sub-question, is shown below:

"If a Bachelor of Neuroscience degree were offered at UofL:"

a) I would pick that degree as my major (8%, 66 students)
b) I would consider picking that degree as my major (51%, 396 students)
c) I would not pick that degree as my major (41%, 322 students)

While the survey was not carried out using formal methodology, it does suggest that there would be substantial student interest if UofL offered the degree. Even if only one-third of the 66 students who answered option "a" chose the degree, around 20 students would enter the degree program each year. While this survey taps the interest of current UofL students, it also suggests that the new degree could attract some students from exiting majors. The most likely major to lose students to this degree would be psychology. However, since much of the elective coursework for the proposed degree comes from existing psychology courses, credit hour production for those courses should not be substantially reduced. Based on student interest, we are optimistic that this degree will attract new students to UofL who might otherwise rule out UofL in the absence of a neuroscience degree.

We also have anecdotal data from the Office of Admissions and Dr. Rich Lewine, former Director of Undergraduate Studies in the Department of Psychological and Brain Sciences, about students who inquire whether UofL has an undergraduate degree in neuroscience or how they can craft a curriculum with that concentration.

An admission counselor reached out to our department with the following query: *"My name is (redacted) and I am a new Admissions Counselor at UofL. Last week, I was at a college fair and a prospective student inquired about opportunities to study neuroscience at UofL. I understand that Psychology and Neuroscience are two different fields, but is there anything comparable that they can study at UofL to Neuroscience?"*

One student who transferred to UofL from another institution commented: *"I was concerned about U of L not having a neuroscience major since I was working towards that at my previous institution. I ended up doing a "makeshift" neuroscience major of the sorts through psychology, chemistry and biology electives."*

Clearly students are astutely aware of neuroscience training opportunities, and the program proposed here will help us to recruit students interested in pursuing that area of study.

b. Identify the applicant pool and how they will be reached.

Applicants will come from the traditional pool of students who apply to UofL and who have interest in further studies in health sciences and/or psychological/brain sciences. High school students who are interested in health sciences may be steered by counselors toward the neuroscience bachelor's program. Many of these students aspire to enroll in graduate or professional school programs after college and this program will provide excellent preparation for advanced study. The staff at UofL office of admissions often make outreach trips to high schools around the region and will be able to assist with promoting the degree program. Also, UofL is undertaking efforts to recruit out-of-state students from cities in the region under a strategic plan to significantly increase enrollment (see below).

c. Describe the student recruitment and selection process.

As mentioned above, UofL has outreach programs dedicated to recruiting students from regional high schools. The program will also be promoted through traditional means, such as advertising on UofL's admissions web sites, brochures, the undergraduate catalog and electronic communications. We will create a web page for the degree program to describe the focus of the curriculum, possible degree paths, and provide links to the research pages of the participating faculty and research labs. The faculty co-directors or staff will also attend the A&S Majors Fair, the KCTCS Showcase and the JCC Majors Fair to disseminate information about the program. We work with Jim Begany, the new Vice Provost for Enrollment Management and Student Success, to discuss venues through which we can reach untapped student populations to draw new students to the university. Mr. Begany's office recently placed full-time recruiting staff in Chicago, Indianapolis and Nashville to in an effort to increase enrollment at UofL, and he has committed to marketing this new program in those cities. Students will apply as freshman to the University of Louisville and must meet the admissions standards of the College of Arts and Sciences as described above.

Historically, STEM-H fields have a disproportionately low number of females and under-represented minorities who train in these fields, and we are committed to targeting these undergraduate populations to draw more of these students into STEM-H careers. Research has shown that recruitment of students from minority groups is more successful when students of a similar demographic are involved in the recruitment process; therefore, we will aim to bring female and underrepresented minority students who are enrolled in the program, or who are graduate students in

neuroscience, when we attend recruitment events to meet with potential majors. Undergraduate and graduate students can speak to different aspects of the training experience and the potential career options offered by a neuroscience degree.

d. Identify the primary feeders for the program.

The primary student population will be drawn from the UofL undergraduate applicant pool.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

As mentioned above, there has been substantial growth in neuroscience training programs over the past 20 years and our survey data show the continued interest of our students for a BS in Neuroscience. Based on the statistics outlined in previous sections indicating the support for a degree as well as the growth in enrollment at other regional institutions, we are very optimistic that this program will draw new students to UofL.

f. Project estimated student demand for the first five years of the program.

We project an initial cohort of 25 students to enter the program in year 1, followed by a 20% growth rate in subsequent years. The 20% growth is based on that observed by UAB's neuroscience program for the first 5 years of the program.

Academic Year	Degrees Conferred	Majors (Headcount) – Fall Semester
2018-19	0	25
2019-20	0	55
2020-21	0	91
2021-22	12	109
2022-23	15	130

2. Employer Demand: Clearly describe evidence of employer demand. Such evidence may include employer surveys, current labor market analyses, and future human resources projections. Where appropriate, evidence should demonstrate employers' preferences for graduates of the proposed program over persons having alternative existing credentials and employers' willingness to pay higher salaries to graduates of the proposed program.

a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the regional, state, and national levels.

The discipline of neuroscience is relatively young and has experienced rapid growth since late 1960's. It emerged initially as a fusion of the fields of psychology, biology and anatomy, but has since expanded to include biochemistry, genetics, physics, mathematics, philosophy, computer science, bioengineering, cognitive science and even such seemingly disparate fields as economics, law and decision science. Given that the field of neuroscience has such wide-reaching interdisciplinary impact, students of neuroscience, especially neuroscience programs with liberal arts foundations, have opportunities for numerous and varied career

paths. Most undergraduate neuroscience programs prepare students for advanced degree programs in health-related fields such as neuroscience, medicine, dentistry, optometry, audiology, pharmacy, psychology, chiropractic and veterinary medicine. However, students who graduate from this proposed program will also be prepared for careers in law, economics, physical therapy, nursing, biostatistics, science writing and allied health fields, depending on the particular course of electives a student may choose. The U.S. Bureau of Labor Statistics list of areas exhibiting the fastest job growth contain occupations that neuroscience students will be well prepared, including occupational and physical therapy assistants, physical therapists, genetic counselors, audiologists, optometrists and ophthalmic medical technicians. Job growth in these areas is projected to increase from 24% to 41% by 2024. Much of this job growth is fueled by an increase in the mean age of the U.S. population as improvements in health care and education continue to extend lifespan. However, increases in lifespan are often accompanied by a higher prevalence of age-related disorders, including disorders of the brain and peripheral nervous system. As emphasized by the ***Brain Initiative***, the demand for further research in neuroscience highlights our nation's need to train students in this interdisciplinary field. Many students who graduate from this program should be potential applicants to UofL master's, doctoral and professional programs, which will provide additional enrollment and revenue in the graduate and professional schools. This further career training will provide the highly skilled workforce necessary to support the needs of the people of the Commonwealth and the nation. However, there will also be career opportunities for students who stop at the bachelor's degree, including: Science Writer, Science Advocacy, Pharmacy Technician, Clinical Research Assistant, Regulatory Affairs Specialist and Behavioral Health Technician. Ultimately, we believe these students will help grow the economic engine of the state by entering into professional careers that will build Kentucky and retain a highly educated workforce, vital to the state's population and economy. We also envision that students from this program will be attracted to graduate and professional programs at UofL, such as master's and doctoral programs in the departments of Anatomical Sciences and Neurobiology, Psychological and Brain Sciences and Biochemistry and Molecular Biology, the college of Education and Human Development, the School of Public Health and Information Science and the School of Nursing, and the School of Medicine's MD program. When this degree program is approved, the co-directors will notify the aforementioned departments and schools so they may develop a recruiting/outreach plan to attract Neuroscience majors to their graduate and professional programs.

3. **Academic Disciplinary Needs: Clearly describe all evidence justifying a new program based on changes in the academic discipline or other academic reasons.**

UofL has a critical mass of strong neuroscience faculty across several different departments (see list of potential mentors at end of document), but they are especially concentrated in the Department of Anatomical Sciences and Neurobiology and the Department of Psychological and Brain Sciences. These two departments will jointly administer the new BS in Neuroscience, the first venture at UofL to develop an undergraduate program overseen by departments from the Belknap and Heath Sciences Campus. The two departments offer coursework research experiences that, when combined in the sequence

proposed here, provide a unique training experience that cannot be obtained through any currently existing baccalaureate degree programs.

4. **If the proposed program is an advanced practice doctorate, explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new doctoral program.** N/A

5. **Similar programs: A new program may serve the same potential student population, the proposed program must be sufficiently different from existing programs in the state or access to existing programs must be sufficiently limited to warrant initiation of a new program.**

   a. **If similar programs exist in Kentucky,**

      i. **Does the proposed program differ from existing programs? If yes, please explain.**

      The neuroscience programs at Morehead and Transylvania are administered through solely through the department of psychology, which differs from the program at UK. The Neuroscience program at UK is jointly administered through the departments of Biology, Anatomy and Neurobiology and Psychology. The BS in Neuroscience program proposed here will be co-administered by Psychological and Brain Sciences and Anatomical Sciences and Neurobiology. UofL and UK are the only two research intensive universities in the state and both have a critical mass of expert neuroscience faculty. Students who train at UofL and UK will have access to world-class neuroscience labs, and therefore opportunities for rich research experiences and mentoring by experts in their respective sub-fields of neuroscience. The areas of expertise of the neuroscience faculty at UofL differ somewhat from that at UK. For example, there are several faculty engaged in sensory systems research neuroscience, regulation emotion and spinal cord research at UofL, therefore providing students with distinct research and curricular opportunities here.

      Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs? If yes, please explain.

      There are no research intensive universities offering neuroscience degrees in the western half of the state; therefore this program will serve students from the metropolitan Louisville area, the western portions of Kentucky and the southern-most Indiana counties, in particular, those which participate in tuition reciprocity with UofL. We also expect to attract students from the metropolitan areas of Chicago, Indianapolis and Nashville, where UofL has now has placed regional recruiters who can market this program.

      ii. **Is access to existing programs limited? If yes, please explain.**

      Yes, to some degree. As mentioned above, this program will serve a regional area of Kentucky and southern Indiana, facilitating access to students from those areas.

iii. Is there excess demand for existing similar programs? If yes, please explain.
Enrollment data from other institutions (cited above and in C.1.a) points to robust interest in neuroscience programs and sufficient demand to support a new program at UofL. The University of Kentucky (http://www.uky.edu/iraa/enrollment-demographics) reports 163 new neuroscience majors as of August, 2016, therefore suggesting high demand for these programs at research intensive institutions in the state.

iv. Will there be collaboration between the proposed program and existing programs?

i. If yes, please explain the collaborative arrangements with existing programs.
Our conversation with Dr. Geddes at UK (as noted above) suggests that there is the potential for collaboration and student training opportunities with that program. UK also hosts the Kentucky Young Scientist Summer Program, which targets students from underrepresented minorities, financially disadvantaged backgrounds or who are first generation college students. We are also open to collaboration with the programs at Morehead State, Transylvania University as opportunities arise, and once this program is approved we will reach out to the directors for those programs to explore possibilities for collaborations, for example, through "Neuroscience Day", which is held annually at UofL in collaboration with the local chapter of the Society for Neuroscience.

Another possible venue for collaboration exists with the Kentucky Biomedical Research Infrastructure Network (KBRIN), which has been funded since 2001 by the National Institutes of General Medical Sciences at NIH. The mission of KBRIN is "…. to develop a network of support for biomedical researchers and educators within the Commonwealth of Kentucky. The purpose of the network is to develop infrastructure and capacity for biomedical research and training in the state." The University of Louisville, through the Department of Anatomical Sciences and Neurobiology, is the host institution for KBRIN; however, outreach efforts extend beyond UofL to the University of Kentucky, to regional universities such as Morehead State, and other partner institutions. KBRIN supports involvement of undergraduates in research through various educational programs. For example, KBRIN funds a week-long training module during the summer in Bioinformatics and Genomics at the University of Kentucky that students across the state are eligible to attend. This training module would be an excellent opportunity for students in the BS in Neuroscience program to participate in as an extended research experience. Dr. Nigel Cooper, current director of the KBRIN program, has informed us that there are ongoing discussions to expand this module to UofL in order to offer an additional summer course. Furthermore, the recent addition of a new KBRIN-supported Electron Microscopy (EM) Core at UofL offers the possibility of creating a new EM training module to further augment research and technological experiences for students in the biomedical

sciences. The KBRIN network provides a venue to facilitate collaboration between undergraduate neuroscience programs at Kentucky institutions to enhance the training experience for all students. Students may also take advantage of UofL's Summer Research Opportunity Program (SROP) at UofL. This program provides an intensive 10 week research experience for undergraduate students. Students are paired with a mentor from one of UofL's graduate programs to work on a project over the summer, but students also attend professional development seminars where they learn about the advantages of graduate education, how to apply for graduate school, and how to enhance their presentation skills.

ii. If no, please explain why there is no proposed collaboration with existing programs.

D. Cost and Funding of the Proposed Program

The resource requirements and planned sources of funding of the proposed program must be detailed in order to assess the adequacy of the resources to support a quality program. This assessment is to ensure that the program will be efficient in its resource utilization and to assess the impact of this proposed program on the institution's overall need for funds.

1. Will this program require additional resources? Y or N. If yes, provide a brief summary of additional resources that will be needed to implement this program over the next five years.

Yes, this program will require new resources in the form of two graduate teaching assistants. Most of the courses for this degree program are already offered. Three ASNB courses currently offered at the graduate level (600-level) will be offered concurrently at the 500-level so that undergraduate neuroscience students may enroll for credit. The deans of the College of Arts and Sciences and the School of Medicine have also each agreed to provide one new Graduate Teaching Assistant (GTA) line (total of 2 lines) as permanent funding for the program to support undergraduate instruction in the new program, especially in the ASNB neuroscience-based core which will see increased enrollment. This will also provide the added benefit for ASNB graduate students who are funded by the GTA to obtain undergraduate teaching experience as professional development, which is currently unavailable in the department. The Department of Psychological and Brain Sciences has also hired new faculty member in the Neuroscience area, Dr. Nicholas Hindy, who will join the department in the Fall 2017 semester. This hire is in direct support of the department's mission to strengthen neuroscience training and instruction. Additionally, the Dean of the College of Arts and Sciences indicates in her letter of support that she will provide a term faculty line to the Department of Mathematics in support of the new General Education curriculum, the "Cardinal Core", which will free up instructors in that department to teach upper division courses and benefit the BS in Neuroscience degree since there is a requirement of Calculus I for the degree.

2. **Will this program impact existing programs and/or organizational units within your institution? Y/N If yes, please describe the impact.**
We suspect that a small proportion of students who are interested in pre-med degree tracks and would normally enroll in biology or chemistry might instead decide to enroll in the new neuroscience major. While this may slightly affect enrollment in those degree programs, we also see the opportunity for students to double major in neuroscience and biology or chemistry, which would mitigate some of the loss from those majors.

As enrollment in the neuroscience program increases, enrollment in required courses in supporting departments will increase in parallel. This will mainly affect the Departments of Biology, Chemistry and Physics. We will stay in contact with the chairs of those departments to assess the degree to which this program places any additional burden on the supporting courses in those departments. If the increased enrollment becomes a significant strain on those courses, we will need to have conversations with the chairs and the dean about offering additional sections of those courses, and new revenue from this program may make is possible to support additional sections. If course section expansion is not feasible, then discussions will take place to limit the enrollment to the neuroscience major. However, limiting enrollment will defeat the purpose of offering the new program and limit our ability to attract new students to UofL.

While each of the participating departments will contribute a faculty co-director, to ensure a proper balance of faculty governance and oversight of the program by each department, a program steering committee will be created to provide administrative management of the degree. This committee will consist of the faculty co-directors and two additional faculty from each department, selected from a pool of nominees from each department and elected by departmental faculty. This committee will provide an annual report to the chairs of each department and to the dean of the colleges, which will summarize student admission, retention and graduation and alumni tracking data, and address any advising or curriculum issues that have arisen throughout the year. This committee will also determine changes needed in the curriculum of the program, which must be endorsed by the departmental faculties.

3. **Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.**
Based on the enrollment data we have provided from other institutions and the prospects for enrollment at UofL, we are optimistic that a new BS in Neuroscience will grow overall enrollment. As outlined above, we project 20% growth in enrollment per year of the program, reaching a total enrollment 130 students by year 5 of the program. This increase in student enrollment will bring an estimated $1.8 million in tuition revenue to the university. There are other less tangible benefits as well. The new program will heighten visibility of the university by increasing the number of graduates and attracting students who would have sought this degree elsewhere. Graduates are likely to go on to professional degree programs, especially in health sciences and research, and in pursuing careers in those fields provide the workforce necessary for the growth of the Commonwealth. This program will also bolster the pipeline of potential students for the states' graduate and professional programs.

Cost/Funding Explanation

Complete the following table for the first five years of the proposed program and provide an explanation of how the institution will sustain funding needs. *The total funding and expenses in the table should be the same, or explain sources(s) of additional funding for the proposed program.

A. Funding Sources, by year of program	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**
Total Resources Available from Federal Sources New Existing					
Narrative Explanation/Justification					
Total Resources Available from Other Non-State Sources New Existing					
Narrative Explanation/Justification:					
State Resources New Existing					
Narrative Explanation/Justification:					
Internal Allocation Internal Reallocation			$96,084	$97,753	$100,488
Narrative Explanation/Justification: The source and process of allocation and reallocation should be detailed, including an analysis of the impact of the reduction on existing programs and/or organization units. We are requesting funds to support 2 new GTA lines for the program, 1 each from the deans of A&S and the SoM. These GTAs will support instruction in upper-division undergraduate courses, primarily in the Department of Anatomical Sciences and Neurobiology. The first cohort of students will not enter these courses until Year 3 of ; therefore, funds for 2 new GTA lines are requested in Years 3-5, and continuing thereafter. The funds for the GTA lines assume an average stipend of $26,500, benefits and 12 months of full-time tuition charged at the resident rate. A benefits and tuition were escalated 3% each year.					
Student Tuition New Existing	$318,516	$700,735	$1,194,180	$1,473,303	$1,809,965
Narrative Explanation/Justification: Describe the impact of this program on enrollment, tuition, and fees. We project first year enrollment at 25 students with a growth rate of 20% in each of Years 2-5 (enrollment in subsequent years includes growth rate plus currently enrolled students). By year 5, after graduating the first cohort of students in the previous year, we project total enrollment to be 130 students. Projected revenues are based upon full-time enrollment for Fall and Spring semesters each year. Resident/non-resident student ratios of 89%/11% were used for tuition calculations, and are presumed to follow the university-wide undergraduate enrollment demographics.					
TOTAL	$318,516	$700,735	$1,194,180	$1,473,303	$1,809,865

B. Breakdown of Budget Expenses/Requirements	1st Year	2nd Year	3rd Year	4th Year	5th Year
Staff:					
Executive, Administrative, Managerial New Existing					
Other Professional New Exisiting					
Faculty New Existing					
Graduate Assistants New **(2 new lines)** Existing			$96,084	$97,753	$100,488
Student Employees New Existing					
Narrative Explanation/Justification: *Includes salaries of all listed above. Identify the number of new faculty required and whether the new hires will be part-time or full-time. Identify the number of assistantships/stipends that will be provided. Include the level of support for each assistantship/stipend.* See explanation above for graduate assistants.					
Equipment and Instructional Materials New Existing					
Narrative Explanation/Justification:					
Library New Existing					
Narrative Explanation/Justification:					
Contractual Services New Existing					
Narrative Explanation/Justification					
Academic and/or Student Support Services New Existing					
Narrative Explanation/Justification					

Other Support Services New Existing					
Narrative Explanation/Justification					
Faculty Development New Existing					
Narrative Explanation/Justification					
Assessment New Existing					
Narrative Explanation/Justification					
Other New Existing					
Narrative Explanation/Justification:					
TOTAL New Existing	0	0	$95,084	$96,753	$100,488

E. Program Review and Assessment

Describe program evaluation procedures for the proposed program. These procedures may include evaluation of courses and faculty by students, administrators, and departmental personnel as appropriate. Program review procedures shall include standards and guidelines for the assessment of student outcomes implied by the program objectives and consistent with the institutional mission.

1. **For each assessment method, please provide direct indicators of achievement of program-level student learning outcomes and frequency of data collection:**
   a. **Which components will be evaluated?**

   Evaluation will include the entire curriculum including core courses, supporting courses, electives, and research experiences/placements. Also included will be student course evaluations, exit surveys collected at graduation, student learning outcomes (SLO) and the following program metrics: freshmen enrollment, transfer students (both from other universities and from degree programs within UofL), degree productivity, time to degree plans after degree (job placement, internships or further education). Students will be required to participate in a Culminating Undergraduate Experience

(CUE). Many of the CUEs will be research focused, and we will catalog the research topics and original research presentations given by the students.

b. When will the components be evaluated?

The curriculum and student learning outcomes will be evaluated annually. Every UofL academic program undergoes regular program review that takes place in two cycles: a Five-Year Review and a Ten-Year Review. As well, new undergraduate academic programs are initially reviewed by the Kentucky Council on Post-secondary Education after 5 years.

c. When will the data be collected?

Course data are collected each semester, graduation exit evaluations in May and December, SLO data and other program metrics annually.

d. How will the data be collected?

Online course evaluations, surveys and data analytics as performed annually by Institutional Research (eg. Graduating Senior Survey and Graduation Application Survey).

e. What will be the benchmarks and/or targets to be achieved?

Benchmarks will be similar to those for other A&S undergraduate degree programs as outlined in the A&S Strategic Plan and by CPE metrics established for undergraduate degree programs. Successful 4 year and 6 year graduation for the degree rates should meet or exceed those for the College of Arts and Sciences as a whole. For the 2010 cohort, those values are 25.7% and 48.7%, respectively. We also expect at least 50% of the graduating class to pursue postgraduate education by enrolling in a graduate or professional school. We engage in active outreach to the alumni to track job placement and educational attainment as outcomes metrics for our graduates.

f. What individuals or groups will be responsible for data collection?

The department chairs will be responsible for reviewing course evaluations offered by their respective departments and the program steering committee will oversee SLO reporting. Institutional Research oversees other program data metrics used for reporting to IPEDS and the state CPE.

g. How will the data and findings be shared with faculty?

Evaluation metrics will be shared at departmental faculty meetings and at annual departmental retreats.

i. How will the data be used for making programmatic improvements?

Findings will be assessed and adjustments determined by the program steering committee and shared at departmental faculty meetings as needed. Curricular changes will be determined by the program steering committee and endorsed by the departmental faculties.

2. What are the measures of teaching effectiveness?

The program will use teaching evaluations, peer review of teaching and graduation exit questionnaires.

3. What efforts to improve teaching effectiveness will be pursued based on these measures?

The program directors will meet with department chairs to review the measures of teaching effectiveness. The program directors, in consultation with the department chair, will make recommendation to the faculty for improvements as needed.

4. **What are the plans to evaluate students' post-graduate success?**
   The co-directors will keep records of students' paths after graduation and will strive to update students' records on a regular basis to follow their career trajectories. The Office of Alumni Affairs may also provide data on the program's graduates.

References

Kentucky Council on Postsecondary Education, (2016). "Stronger by Degrees: A Plan to Create a More EDUCATeD & Prosperous Kentucky. 2016-2012 Strategic Agenda for Postsecondary and Adult Education".

Ramos, R. L., et al. (2011). "Undergraduate Neuroscience Education in the U.S.: An Analysis using Data from the National Center for Education Statistics." J Undergrad Neurosci Educ **9**(2): A66-70.

Proposed flight plan for Neuroscience BS degree program (basic plan)

YEAR ONE				TOTAL HOURS	
Semester 1		Semster 2			
Gen 101	3	ENGL 102	3		
ENGL 101	3	BIOL 242	3		
PSYC 201	3	BIOL 244	3		
BIOL 240	3	PSYC 301	3		
CHEM 201	3	CHEM 201	3		
CHEM 207	1	CHEM 208	1		
	16		**15**	**31**	Milestones: Complete Psych 201 and 301; no grades in courses required for the NS BS below C

YEAR TWO					
Semester 3		Semester 4			
Free Elective	3	Free Elective	3		
CHEM 209	1	Language	3-4		
BIOL 329	3	PSYC 443 (343)	3		
PSYC 302	3	BIOL 465	3		
PHYS 221	3	PHYS 222	3		
PHYS 223	1	PHYS 224	1		Milestones: Complete Psych 302, Psych 443; no grades in required courses below C
	14		**15-16**	**31-32**	

YEAR THREE					
Semester 5		Semester 6			
ASNB 502	3	Gen Ed elective	3		
Psyc 331	3	Free elective-WR	3		
Free elective	4	Gen Ed elective	3		
Free elective	3	MATH 205	4		
Language	3-4	Free elective	3		
	15-16		**16**	**30-31**	Milestones: Complete ASNB 502 course; no grades in required courses below C

YEAR FOUR					
Semester 7		Semester 8			
ASNB 517 or 566	3	Free elective	3		
Free elective	3	Free elective	3		
Gen Ed elective	3	Gen Ed elective	3		
Free elective	3	Gen Ed elective	3		
NSCI 400	3	NSCI 400-CUE	3		
	15		15	**30**	

PROGRAM TOTAL				**122-125**	

NOTES

1) Premed students will meet prerequisites by taking Supporting electives
2) Gen Ed electives are delayed until the final semesters in order to facilitate MCAT preparation and to prepare for the NSCI 400 research experience
3) When/if Gen Ed requirements decrease, both Supporting and free elective requirements will increase by 3 hours
4) The freshman year is challenging; it's important to be sure that the student is prepared for this rigorous program and to offer alternative curricula if necessary early in their academic career
5) Should a student have selected both Math 180 and two semesters of 3-hour languages, they will need to add a one hour HSS activity class to Semester 3 to total 121 overall hours

Faculty Roster Form Qualifications of Full-Time and Part-Time FacultyName of Primary Department, Academic Program, or Discipline: Department of Psychological and Brain Sciences

Name of Institution: Univeristy of Louisville

Academic Term(s) Included: Fall-2014 - Fall 2016 **Date Form Completed: October 14, 2016**

1	2	3	4
NAME (F, P)	**COURSES TAUGHT Including Term, Course Number & Title, Credit Hours**	**ACADEMIC DEGREES& COURSEWORK Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if**	**OTHER QUALIFICATIONS & COMMENTS Related to Courses Taught**
Paul DeMarco (F)	Fall 15: Psyc 201-Intro to Psyc 3 Cr Hrs. Spring 16: Psyc 331-Sensation & Preception 3 Cr Fall 16: Psyc 201-Intro to Psyc 3 cr hrs	Ph.D. Vanderbilt (1989)	
Brendan Depue (F)	Fall 15: Psyc 609-Topics in Neuroimaging 3 CR Fall 16:Psyc 609-Intro to Neuroimaging Analysis 3 CR	Ph.D. University of Colorado at Boulder (2009)	
He Zijiang (F)	Fall 14: Psyc 331-Sensation & Perception 3 CR Spring 15: Psyc 404- Honors Perception & Action 3 CR Psyc 605-IND Study Preceptual Learning	Ph.D. Univ. of Alabama at Birmingham (1990)	
Maria Kondaurova (F)	Fall 15: 301-Quan Meth PSYC 3 CR Spring 16: 611-Advanced Stats II 3 CR Fall 16: 301-Quan Meth 609-Speech Science 3 CR	Ph.D. Purdue Univ (2008)	
Keith Lyle (F)	Fall 15: Psyc 301-Quan Meth, Psyc 404-HON Human Memory 3 CR Spring 16: Psyc 322 Cog. Process & 636 Human Memory 3 CR Fall 16: Psyc 310-Pscyh of Diversity 3 CR Psyc 645-Cognitive Neuroscience 3 CR	Ph.D. Yale University (2005)	
John Pani (F)	Fall 15: Psyc 322 Cognitive Processes, Psyc 621 Cognitive Processes Spring 16: Psyc 422 Intro Cognitive Neuroscience, Psyc 601 History of Psych Fall 16: Psyc 322 Cog Proc, Psyc 621 Cog Proc	Ph.D. Univ of Illinous Urbana-Champaign (1985)	
Heywood Petry(F)	Fall 15: Psyc 344 Physiological Psyc 3 CR Spring 16: Psyc 344-Physiological Psyc 3 CR, Psyc 414 HON Graw & Psyc 3 CR Fall 16: Psyc 642-Behavioral Neuroscience 3 CR	Ph.D. Brown University (1980)	
Sandra Sephton (F)	Fall 15: Psyc 344 Physiological Psyc 3 CR Spring 16: Psyc 344-Physiological Psyc 3 CR Fall 16: Psyc 344-Physiological Psyc 3 CR	Ph.D. Brigham Young University (1995)	
Christian Stilp (F)	Fall 15: Psyc 301-Quan Meth in Psyc 3 CR Spring 16: 301-Quan Meth Psyc 3 CR Psyc 631 Sensation and Perception 3 CR Fall 16: Psyc 301-Quan Meth 3 CR, Psyc 602-Research in Exper Psyc 3 CR	Ph.D. University of Wisc-Madison (2011)	

Pavel Zahorik (F)	Fall 16: Psyc 646 Hearing Science 3 CR	Ph.D. University of Wisc-Madison (1998)	

Faculty in Department of Anatomical Sciences and Neurobiology
Academic Term(s) Included: Fall-2014 - Fall 2016 Date Form Completed: October 14, 2016

Richard Benton (F)	Fall 16, ASNB 606- Seminars in Anatomy and Neurobiology, 1 cr hrs, G	Ph.D. University of Oklahoma (2000)	
Martha Bickford (F)	Spring 16, ASNB 666, Synaptic Fall 16, ASNB 602, Fundamentals of Neuroscience, 4 cr hr, G Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med	Ph.D. Duke University (1989)	
Bart Borghuis (F)	Fall 16, ASNB 602, Fundamentals of Neuroscience, 4 cr hr, G Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med	Ph.D. Utrecht University, The Netherlands (2003)	
Brian Davis (F)	Fall 16, ASNB 617, Developmental Neurobiology, 3 cr hrs, G Fall 16, BMSC 809-02_4162, Survey of Dental Gross and Neuroanatomy, 7 cr hrs, Med Spring 17, ASNB/OBIO 675, Advanced head and Neck Anatomy,	Ph.D. University of Oklahoma (2011)	
William Guido (F)	Fall 16, ASNB 617, Developmental Neurobiology, 3 cr hrs, G	Ph.D. University of North Carolina, Greensboro (1985)	
Charles Hubscher (F)	Fall 16, ASNB 602, Fundamentals of Neuroscience, 4 cr hr, G Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med	Ph.D. University of Florida (1994)	
Robin Krimm (F)	Fall 16, ASNB 617, Developmental Neurobiology, 3 cr hrs, G	Ph.D. University of Virginia (1996)	
Ashok Kumar (F)	Spring 16, ASNB 614, Molecular Neuroscience, 4 cr hrs, G	Ph.D. Univesity of Delhi, India (1996)	
Yuki Kuwabara (F)	Fall 16, ASNB 602, Fundamentals of Neuroscience, 4 cr hr, G Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med Fall 16, BMSC 809-02_4162, Survey of Dental Gross and Neuroanatomy, 7 cr hrs, Med	Ph.D. Sophia University, Japan (1986)	
Robert Lundy (F)	Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med Fall 16, ASNB 602, Funsamentals of Neuroscience, 4 cr hr, G	Ph.D. Florida State University (1998)	

Aaron Mcgee (F)	Fall 16, ASNB 606- Seminars in Anatomy and Neurobiology, 1 cr hrs, G Fall 16, ASNB 617, Developmental Neurobiology, 3 cr hrs, G	Ph.D. University of California, San Francisco (2001)	
Patrick Moore (F)	Fall 16, ASNB 602, Fundamentals of Neuroscience, 4 cr hr, G Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med Fall 16, BMSC 809-02_4162, Survey of Dental Gross and Neuroanatomy, 7 cr hrs, Med	Ph.D. University of Kentucky (1997)	
Jeff Petruska (F)	Fall 16, ASNB 602, Fundamentals of Neuroscience, 4 cr hr, G Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med Spring 16, ASNB 666, Synaptic Organization of the Central Nervous System, 3 cr hrs, G	Ph.D. University of Florida (2000)	
Matthew Qui (F)	Fall 16, ASNB 617, Developmental	Ph.D. University of Iowa (1992)	
Guillermo Rougier (F)	Fall 16, ASNB 617, Developmental Neurobiology, 3 cr hrs, G	Ph.D. Buenos Aires University (1993)	
Chad Samuelsen (F)	Fall 16, ASNB 602, Fundamentals of Neuroscience, 4 cr hr, G Fall 16, ASNB 502, Fundamentals of Neuroscience, 3 cr hrs, G, Med Fall 16, ASNB 606- Seminars in Anatomy and Neurobiology, 1 cr hr, G	Ph.D. Florida State University (2009)	

Neuroscience Faculty Who May Serve as Research Mentors

Potential Research Mentors For Students in the Bachelor of Neuroscience Degree

Faculty	Primary Department	Primary Research Interests	Lab Website
Behrman, Andrea	Neurological Surgery	Pediatric rehabilitation	http://louisville.edu/kscirc/translational-research/pediatric-translational-research
Bickford, Martha	Anatomical Sciences & Neurobiology	Functional organization of central visual circuits	louisville.edu/medicine/departments/anatomy/facultylist
Bertocci, Gina	Biomedical Engineering	Injury biomechanics, rehabilitation engineering, orthopedic biomechanics	http://louisville.edu/speed/people/faculty/bertocciGina
Borghuis, Bart	Anatomical Sciences & Neurobiology	Synaptic and circuit mechanisms of the retina	louisville.edu/medicine/departments/anatomy/facultylist
Boyake, Maxwell	Neurological Surgery	Neurosurgical outcomes and translational research	http://louisville.edu/bucksforbrains/faculty/maxwell-boakye.html
Corbitt, Cindy	Biology	Behavioral neuroendocrinology, environmental signaling and the CNS	http://louisville.edu/biology/faculty/c0corb01/
DeMarco, Paul	Psychological & Brain Sciences	Non-invasive assessment of visual function, coding in parallel visual pathways	https://louisville.edu/psychology/demarco/lab
Dove, Guy	Philsophy	Philosophy of Psychology & Cognitive Science, Philosophy of Mind and Linguistics	https://louisville.edu/philosophy/People/faculty-1/faculty-profile-pages/dr.-dove
Depue, Brendan	Psychological & Brain Sciences	Functional neuroimaging, Inhibitory and cognitive control in pre-frontal cortex	https://louisville.edu/psychology/depue
El-Mallakh, Rif	Psychiatry and Behavioral Sciences	Pathophysiology of bipolar disorder	http://louisville.edu/medicine/departments/psychiatry/faculty/el-mallakh
Elpidorou, Andres	Philsophy	Philosophy of Mind, Metaphysics, Philosophy of Psychology, Phenomenology	https://louisville.edu/philosophy/People/faculty-1/faculty-profile-pages/andreas-elpidorou
Friedland, Robert	Neurology	Clinical and biological issues in Alzheimer's disease and related disorders	http://louisville.edu/medicine/departments/neurology/faculty/friedland
Gregg, Ronald	Biochemistry & Molecular Biology	Synaptogenesis and development in the retina	http://louisville.edu/medicine/departments/biochemistry/DepartmentalDirectories/faculty/gregg
Guido, William	Anatomical Sciences & Neurobiology	Circuit development of the visual thalamus	http://louisville.edu/medicine/departments/anatomy/facultylist/william-guido-phd
Harkema, Susan	Neurological Surgery	Neural mechanisms responsible for human locomotion	http://louisville.edu/kscirc/basic-research/faculty-1/susan-harkema
He, Zijiang	Psychological & Brain Sciences	Perception of visual objects and the spatial environment	http://louisville.edu/psychology/he/lab/research
Hetman, Michal	Neurological Surgery	Molecular interventions to minimize spinal cord damage	http://louisville.edu/bucksforbrains/faculty/hetman
Hindy, Nicholas	Psychological & Brain Sciences	Cognitive Neurosciece of Object Recognition	
Howland, Dena	Neurological Surgery	Spinal cord response to injury	https://louisville.edu/kscirc/basic-research/faculty-1/dena-howland
Hubscher, Charles	Anatomical Sciences & Neurobiology	Pelvic organ function and chronis pain following spinal cord injury	http://louisville.edu/medicine/departments/anatomy/facultylist/charles-hubscher-phd
Kaplan, Henry	Ophthalmology & Visual Sciences	retinal regeneration, age-related macular degeneration, retinal degeneration	http://www.louisvilleeyedocs.com/member/henry-j-kaplan-m-d/clinical-faculty/
Keynton, Robert	Biomedical Engineering	BioMEMS, microfluidics, MEMS modeling, micromechanical machining	louisville.edu/speed/people/faculty/keyntonRobert
Kondaurova, Maria	Psychological & Brain Sciences	Acoustic phonetics of speech, language development, hearing loss	http://louisville.edu/psychology/kondaurova
Krimm, Robin	Anatomical Sciences & Neurobiology	Development and circuitry of the peripheral taste system	http://louisville.edu/medicine/departments/anatomy/facultylist/robin-krimm-ph.d
Kumar, Ashok	Anatomical Sciences & Neurobiology	Development of the novel therapies for skeletal muscle disorders	http://louisville.edu/medicine/departments/anatomy/facultylist/ashok-kumar-ph.d
Levinson, Cheri	Psychological & Brain Sciences	Eating Anxiety Disorders	http://www.louisvilleeatlab.com
Lyle, Keith	Psychological & Brain Sciences	Memory, memory enhancement, individual differences in memory	https://louisville.edu/psychology/lyle
Lominadze, David	Physiology	Neural trauma from cardiovascular and cerebrovascular disease	https://louisville.edu/medicine/departments/physiology/faculty/lominadze
Lundy, Robert	Anatomical Sciences & Neurobiology	Mechanisms of central taste processing	http://louisville.edu/medicine/departments/anatomy/facultylist/robert-f.-lundy-jr.-ph.d
Magnuson, David	Neurological Surgery	Locomotor systems in spinal cord injury and repair	https://louisville.edu/kscirc/basic-research/faculty-1/david-magnuson
McCall, Maureen	Ophthalmology & Visual Sciences	Normal retinal function and dysfunction by retinal diseases, restoration of vision	http://www.louisvilleeyedocs.com/member/maureen-mccall-ph-d/research-faculty/
McGee, Aaron	Anatomical Sciences & Neurobiology	Genes and mechanisms governing plasticity in sensory circuits	http://louisville.edu/medicine/departments/anatomy/facultylist/aaron-mcgee-phd
Ovechkin, Alexander	Neurological Surgery	Impairment of respiratory and cardiovascular systems after spinal cord injury	http://louisville.edu/kscirc/basic-research/faculty-1/alexander-ovechkin
Pani, John	Psychological & Brain Sciences	Learning of neuroanatomy and methods for visualizing complex network data	http://louisville.edu/psychology/pani/lab
Petruska, Jeffrey	Anatomical Sciences & Neurobiology	Plasticity of peripheral nerves and spinal cord	http://louisville.edu/medicine/departments/anatomy/facultylist/jeffrey-petruska-phd
Petry, Heywood	Psychological & Brain Sciences	Neural coding of visual movement and attention	http://louisville.edu/psychology/petry/lab
Pitts, Teresa	Neurological Surgery	Neural control of swallowing, cough, breathing	http://louisville.edu/kscirc/basic-research/faculty-1/teresa-pitts-ph.d
Samuelsen, Chad	Anatomical Sciences & Neurobiology	Cortical integration of taste and smell and the neural basis of flavor perception	http://louisville.edu/medicine/departments/anatomy/facultylist/chad-samuelsen-ph.d
Scott, Patrick	Ophthalmology & Visual Sciences	Corneal disease, retinal degeneration	http://www.louisvilleeyedocs.com/member/patrick-scott-o-d-ph-d/clinical-faculty/
Sephton, Sandy	Psychological & Brain Sciences	Biological mediators of psychosocial effects in health, psychoneuroimmunology	https://louisville.edu/psychology/sephton/biobehavioral
Tamiya, Shigeo	Ophthalmology & Visual Sciences	Fibrotic complications of the eye and retina	http://www.louisvilleeyedocs.com/member/shigeo-tamiya-ph-d/research-faculty/
Stilp, Christian	Psychological & Brain Sciences	Auditory perception, speech perception, perceptual organization and learning	http://louisville.edu/psychology/stilp/lab
Stirling, David	Neurological Surgery	Mechanisms of white matter degeneration following trauma to the nervous system	http://louisville.edu/kscirc/basic-research/faculty-1/david-stirling-phd
Qiu, Mathew	Anatomical Sciences & Neurobiology	Differentiation and regeneration of motor neurons and oligodendrocytes	http://louisville.edu/medicine/departments/anatomy/facultylist/mengsheng-qiu-ph.d
Terson de Paleville, Daniela	Health & Sports Sciences	Pulmonary function and respiratory muscle activation in individuals with spinal cord in	http://louisville.edu/education/departments/faculty/terson-de-paleville
Whittemore, Scott	Neurological Surgery	Stategies to restore spinal cord function	http://louisville.edu/kscirc/basic-research/faculty-1/scott-whittemore-phd
Zahorik, Pavel	Otolaryngology & Communicative Disorders	Auditory perception and performance, sound localization, spatial hearing	louisville.edu/psychology/zahorik/lab

UNIVERSITY OF LOUISVILLE
UNIVERSITY LIBRARIES

Office of the Dean

February 13, 2017

Connie Shumake
Office of the Provost
University of Louisville
Louisville, KY 40292

Connie,

We have been asked to provide a letter of support for the proposed bachelor's degree in neuroscience. The University Libraries have prepared an analysis of their ability to support the new degree and the review indicates that our collections are adequate in this area. I am attaching a copy of our review report for your records.

Please contact us if you have any questions or need additional information.

Sincerely,

Robert E. Fox, Jr.
Dean, University Libraries

Cc: Paul DeMarco
Elizabeth Sterner
Tyler Goldberg

University of Louisville . Ekstrom Library, Room 203 . Louisville, KY 40292
P: 502.852.6745 **F**: 502.852.7394 **W**: Louisville.edu/library

EVALUATION OF LIBRARY RESOURCES ESSENTIAL TO THE SUPPORT OF: BACHELOR OF SCIENCE IN NEUROSCIENCE

University of Louisville
Library Services Report

By

Elizabeth Sterner
Collection Specialist/
STEM Teaching and Faculty Outreach Librarian

Tyler Goldberg
Head, Technical Services/Collection Development (Print)
University Libraries

Robert Fox, Jr.
Dean
University Libraries
2/10/17

Library System Overview

The University of Louisville libraries hold more than 2 million volumes, over 2,200 journals in print, plus access to more than 90,700 electronic journals, over 300 databases and various special collections, media and microforms. Services offered by the libraries include research assistance through various means, state-of-the art delivery of documents, and research instruction. In 2003, the library became the 124th member of the Association of Research Libraries. Membership in the organization is limited to top research-oriented libraries.

There have been several major renovations to the Ekstrom Library in the past few years. A new wing was added in 2005 which included a Robotic Retrieval System (RRS) that stores up to 600,000 volumes (with the capacity of 1.2 million) in a secure but rapidly accessible facility. Several new classrooms and meeting spaces were also added at this time. In addition, the west wing is home to the library's 24-hour study area, accessible by all students during the academic year.

Another major renovation was completed in 2015, which involved an overhaul of the first floor. The east wing renovation accomplished the goal of creating several new dynamic and functional study spaces, and also providing easier access to our main service points (all on one level) including a new central service desk, the Research Assistance and Instruction office, the Digital Media Suite for students, and the Writing Center. Additional information on the renovation can be viewed on our website at: http://louisville.edu/library/ekstrom/reno/home.

Library Staffing and Research Services

Ekstrom Library, the main library on Belknap Campus, is currently staffed by 16 librarians and 21 staff members. Additionally, Kornhauser Health Sciences Library, located on the Health Sciences Campus, supports the School of Medicine, School of Dentistry, School of Nursing, and School of Public Health and Information Systems and is currently staffed by 8.5 librarians and 12 staff members.

The Research Assistance and Instruction office in Ekstrom Library has 12 faculty and staff members and offers e-mail, chat, phone, and in-person research assistance. The consultation desk is staffed Monday – Friday, 9am -5pm, and patrons can also make appointments with librarians for in-depth, one-on-one research help. Research assistance is one of the most heavily used services within the department. According to the 2012 Benchmark survey, approximately 72.5 percent of students were very satisfied or somewhat satisfied with research assistance services.

Elizabeth Sterner is the subject librarian for the STEM fields, and there are several other librarians in the department who provide teaching and research services as well. The librarians share in the duties of teaching classes in addition to supporting student and faculty research through individual consultation, library research guides, online modules, database training, and outreach. In addition, the subject librarians serve as collection specialists, selecting monographs and other resources relevant to the social work curriculum, conducting collection reviews, and working with the Head of Technical Services/Collection Development (Print) on related projects.

Holdings Information

Numbers of items in all formats held and/or accessible to users of the University of Louisville Libraries related to neuroscience are listed below. Numbers were obtained using the Libraries' Discovery catalog.

SUBJECT AREA: Neuroscience	**TITLES HELD**
Books (print and electronic)	32,748
Journal, magazine	2,313
Article, chapter	1,178,857

Subscriptions to online databases related to neuroscience research are listed below:

Access Medicine
Ageline
American Chemical Society Web Edition
BioOne Abstracts & Indexes
BIOSIS Citation Index
CINAHL
Clinical Key
Cochrane Library
CompendexWeb
Draw-It-To-Know-It
DynaMed Plus
EBSCO Academic Search Complete
Embase
Essential Evidence Plus
ETS Testlink
Health & Psychosocial Instruments (EBSCO)
IEEE Xplore
ISI Highly Cited
Journal Citation Reports
Jove
MEDLINE (EBSCO)
MEDLINE (Ovid)
MEDLINE (PubMed)
Mental Measurements Yearbook
Micromedex
PsycARTICLES
ProQuest Dissertations and Theses Global database
PsycINFO (EBSCO)
Psychology & Behavioral Sciences Collection
PubChem
Reaxys
Science Citation Index
ScienceDirect
SciFinder
Social Sciences Abstracts
Social Sciences Citation Index
STAT!Ref
UpToDate
Web of Science

Budget/Purchasing

There is no separate budget for library resources, as the Ekstrom Library materials budget is one entire pool not separated out by subject. The current Ekstrom Library materials budget (2015/16) for the entire system is $9,989,798. Neuroscience faculty

may suggest items for purchase by using an online form. These requests are directed to the Head of Technical Services for print or to the Interim Head of Collections for electronic resources. They may also contact the subject librarians with their requests.

Circulation/Resource Use

The table below indicates, where available, use statistics for databases with resources relevant to neuroscience for the 2016 calendar year:

Database	**Number of Searches**
Access Medicine	7,629
AgeLine	1,148
American Chemical Society Web Ed.	6,404
BioOne Abstracts & Indexes	486
BIOSIS Citation Index	492
CINAHL	55,271
Clinical Key	13,595
Cochrane Library	2,318
CompendexWeb	4,711
Draw-It-To-Know-It	1,560 tutorials viewed
DynaMed Plus	4,013
EBSCO Academic Search Complete	220,811
Embase	1,337
Essential Evidence Plus	960
ETS Testlink	N/A
Health & Psychosocial Instruments (EBSCO)	771
IEEE Xplore	6.516
ISI Highly Cited	N/A
Journal Citation Reports	1,840
Jove	526
MEDLINE (EBSCO)	7,128
MEDLINE (OVID)	120,896
MEDLINE (PubMed)	N/A
Mental Measurements Yearbook	1,211
Micromedex	1,045
PsycARTICLES	1,236
ProQuest Dissertations and Theses Global database	52,091
PsycINFO (EBSCO)	93,953
Psychology and Behavioral Sciences Collection	13,500
PubChem	N/A
Reaxys	3,033
Science Citation Index	See Web of Science Core

ScienceDirect	13,157
SciFinder	16,110
Social Sciences Abstracts	7,780
Social Sciences Citation Index	See Web of Science Core
STAT!Ref	450
UpToDate	N/A
Web of Science Core (includes SCI & SSCI)	27,695

Library Equipment and Technology

Currently there are 106 public computer workstations available for student use in Ekstrom Library including 4 iMacs. There are 56 PC computers and 66 laptops available for instruction lab classes. In addition, Ekstrom Library has 33 laptop computers (including 18 MacBooks) available to be checked out for a four hour period of in-building use. There are also multiple laser printers and photocopy machines available for student use. Printouts and photocopies cost 11 cents per page.

Library Hours

Ekstrom Library hours are posted at the entrances to the building and are available on the library web site:

Regular Fall and Spring Hours

Monday-Thursday	7:30 a.m-2 a.m.
Friday	7:30 a.m.-6 p.m.
Saturday	9 a.m.-5 p.m.
Sunday	Noon-2:00 a.m.

Finals Week

Sunday	Noon-2 a.m.
Monday-Thursday	7:30 a.m.-2 a.m.
Friday	7:30 a.m.-6 p.m.
Saturday	9 a.m.-5 p.m.

Summer Terms

Monday-Thursday	7:30 a.m.-9 p.m.
Friday	7:30 a.m.-5 p.m.
Saturday	9 a.m.-5 p.m.
Sunday	Noon-9 p.m.

In addition, Ekstrom Library has a 24-hour study area which is open at all times during the regular fall and spring semesters and is open until 2 a.m. during the summer semester.

Miscellaneous Services

- Online catalog (WorldCat Discovery).

- E-mail: students use the Microsoft Exchange system, available from any internet-accessible computer. This system is supported by the University's IT Department.

- Interlibrary Loan: For policies, see the box below. **In the 2012 Benchmark survey, approximately 69 percent of respondents were either satisfied or somewhat satisfied with the ILL process.**

Interlibrary Loan Policy The University of Louisville Libraries' Interlibrary Loan policies are based on the Interlibrary Loan Code of the American Library Association (ALA) and the most current copyright law. These policies apply to all University Libraries except the Law Library. Interlibrary Loan is a courtesy provided by the lending library, and any conditions of use imposed by that library must be strictly observed. The lending library may stipulate that use of an item be restricted to the library, and it may prohibit all photocopying of the item. The lending library also stipulates the due date of the item. All items are subject to immediate recall by the lending library.

Copyright and Resource Sharing

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," (as defined by the U.S. Copyright Office) that user may be liable for copyright infringement. Therefore, the University of Louisville Libraries reserve the right to refuse a request if, in its judgment, fulfillment of the request would violate copyright law.

Eligibility

The University of Louisville Libraries provide interlibrary loan services to all faculty, staff, and students of the University of Louisville, as well as members of the Kentucky State Legislature or their designees. A patron's library account must be in good standing to initiate an interlibrary loan.

Individuals and institutions not affiliated with the University of Louisville may be eligible for borrowing privileges by agreement through the University of Louisville Libraries. A fee may be charged for this service. Individuals and institutions not affiliated with the University of Louisville may submit interlibrary loan requests to the Louisville Free Public Library

Law School Faculty and Students may use either Ekstrom Library or Law Library interlibrary loan services. Review Law Library policies .

Submission of Requests

Requests for interlibrary loan service for the University of Louisville Libraries, except the Law Library, must be submitted electronically through the University Libraries' ILLiad system. Requests for interlibrary loan service by the Law Library must be completed at the Law Library circulation desk.

In accordance with copyright law a separate request *must* be submitted for each item. Accurate and complete information about the item and the patron making the request are essential to processing requests. Any request may be cancelled and returned if it lacks sufficient information to be processed. By submitting a request patrons acknowledge their acceptance of Interlibrary Loan policies, fees, and copyright laws.

Patrons must determine accessibility before submitting requests by searching the Libraries Catalog, using Journal Finder and Findit@UofL, and consulting our library staff. Note that some of the Libraries' collections are not cataloged in Minerva (such as the ERIC microfiche collection). Patrons may request items to be transferred between Belknap Campus and Health Sciences Campus via ILLiad. Belknap campus patrons (not eligible for document delivery) must retrieve items from libraries located on Belknap Campus.
Requests for known textbooks will not be processed.

Requests are processed in the order in which they are received. Five requests are processed per patron per day. Additional requests per patron will be processed as the workload permits.

Rush Requests

Rush options for interlibrary loan will be left to the discretion of each library. Costs for rush requests are fixed. A full explanation may be found under the "Fees" section.

Ekstrom Library In-Library Use Policy

In-library use only interlibrary loan requests are identified by a blue band with the words ***In Library Use Only*** in a bold, italicized typeface. This restriction has been set by the loaning institution. Violating this restriction places all University faculty, staff and students in jeopardy of not being able to receive needed research materials from lending institutions.

Ekstrom's ILL department follows the ALA code of responsibilities. In section 4.10 of the ALA code it states that the requesting library is responsible for honoring the due date and **enforcing any use restrictions specified by the supplying library**. In-library use is a restriction that this department must honor.

In-library use materials may be used anywhere inside Ekstrom Library and returned to the Circulation Desk before leaving the library. Crossing a security gate indicates one is no longer in the library. Therefore, the material cannot be taken into the following areas:

- The Tulip Tree Cafe
- The outside tables located at the West entrance
- The group study room located at the East entrance

In-library use items may be used in assigned study carrels (if applicable), but must be returned to the Circulation Desk before leaving for the day.

It is the patron's responsibility to request a renewal for an in-library use item, if a renewal is indicated as allowed on the blue band.

Consequences

In the event in-library use material is taken outside the library, the patron's ILL and Ekstrom library accounts will be suspended until the item is returned. If a student, a bursar block will also be placed on their University account.

As stated on the policies page under the heading Penalties for Misuse, all University of Louisville Libraries' Interlibrary Loan Departments reserve the right to deny interlibrary loan privileges to any patron who abuse the service. This includes the abuse of an in-library use only restriction.

Renewals

Renewals are granted at the discretion of the lending library. The University of Louisville Libraries will honor the stipulations of the lending library. Only one renewal per item can be made using the ILLiad system. Subsequent requests must be made to the interlibrary loan staff. ***All requests for a renewal should be made at least three days before the original due date.*** If the lending library does not grant the renewal, the item must be returned immediately.

Renewal instructions.

Returning Materials

Materials obtained through Belknap Campus Libraries Interlibrary Loan should NOT be placed in book drops. Interlibrary loan materials should be returned directly to the circulation desk of the library where the request originated.

Materials obtained through Kornhauser Health Sciences Interlibrary Loan may be placed in book drops or returned to the circulation desk.

Penalties for Misuse

University of Louisville Libraries Interlibrary Loan Departments reserve the right to deny interlibrary loan *privileges* to any patron who abuses the service.

Overdue Items

Please return the item by the due date. University of Louisville Libraries Interlibrary Loan Departments send overdue notices, however these are a courtesy provided by the department. *Patrons are responsible for their materials even if no notices are received.*

For Ekstrom Library users, patrons need to contact ILL staff if they will need their item for longer than the stipulated loan period. The ILL staff will work with the patron to accommodate their needs.

However, if an ILL item is over one month overdue, and the patron has not contacted the ILL staff, we will request a replacement invoice. The patron will need to pay the replacement invoice to reinstate their ILL privileges. Patrons with overdue interlibrary loan items will have both their interlibrary loan borrowing privileges and their library privileges suspended until the overdue item is returned. A bursar block will also be placed on student accounts.

A patron will have their account restored upon completing the following conditions:

- All overdue material has been returned
- All outstanding fines and fees have been paid

Privileges may be revoked at the discretion of the interlibrary loan supervisor.

Unclaimed Items

Unclaimed items will be sent back to the lending library on the due date of the item.

Damaged and Lost Items

Patrons are responsible for all fees incurred for lost or damaged items.

Believes Item Returned

For Ekstrom Library users, if a borrower believes the library items were returned, please e-mail the ILL borrowing assistant and the ILL Coordinator. We will look for the item(s) for 30 days. During this interval normal borrowing privileges will be allowed. If the item is found the book will be discharged from the borrower account and all fees waived. If the item(s) is not found after 30 days, borrowing privileges will be suspended until either the item(s) is returned or the fees paid. A bursar block will also be placed on students' University accounts. A borrower will be allowed ONE OCCASION with a maximum of two items without assessment of fees if they contacted the ILL Borrowing Assistant and the ILL Coordinator and the item(s) were not found. The item will be removed from the borrower record and the bursar block removed. After this one occasion, or if more than two items are being claims returned (even if on the first occasion), the borrower will be responsible for paying any replacement fees charged by the lending library.

Fees

Interlibrary Loan

Ekstrom and Kornhauser Health Sciences Libraries pay the first $20.00 of the cost toward obtaining any interlibrary loan. If the cost exceeds $20.00, patrons will be notified before an order is placed to determine willingness to pay the difference. If the cost difference is paid, the patron's request will be submitted.

Rush Requests

Not all libraries will offer rush services at all times. Cost for rush services, when available, are listed below. All rush requests submitted after 2:00pm will be processed the following business day.

Time frame	UofL faculty, staff and students	Non-UofL Local Professionals
Within three (3) working days	$10	$25
Next working day	$15	$30
Same working day (photocopies only)	$20	$35

Rush costs are independent of other fees. Rush delivery can never be guaranteed. If material cannot be obtained within the specified time frame, rush fees will not be charged.

Photocopy Service

Please see Document Delivery Policies

Abuse of these policies may result in the suspension or revocation of interlibrary loan privileges.
Revised 1/14/2016

- Document Delivery: For policies see box below

Document Delivery Policies

The University of Louisville Libraries' Document Delivery policies are based on the most current copyright law. These policies apply to all University Libraries except the Law Library and Music Library. Document Delivery is a courtesy provided by the University Libraries, and any conditions of use imposed must be strictly observed. All items are subject to immediate recall by the University Libraries.

Copyright and Resource Sharing The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," (as defined by the U.S. Copyright Office that user may be liable for copyright infringement. Therefore, the University of Louisville Libraries reserve the right to refuse a request if, in its judgment, fulfillment of the request would violate copyright law.

Eligibility

Ekstrom Library provides document delivery services to UofL faculty, staff and graduate students and book delivery to eligible faculty.

Kornhauser Health Sciences Library provides document delivery services to all faculty, staff, and students on the Health Sciences Campus. Document Delivery services are also available to members of the Louisville health services community, including physicians and other health practitioners, and the legal profession for a fee of $15.00 per request. Additional charges may be incurred. A valid UofL Libraries' borrower card is required for ILLiad registration. Requests are only accepted for photocopies. We do not currently offer book retrieval services.

Currently the Music and Law libraries do not offer document delivery service.

There is a 50 page copy maximum per request.

Submission of Requests

Requests for document delivery service for the University of Louisville Libraries, except the Law Library and Music Library, must be submitted electronically through the University Libraries' ILLiad system.

In accordance to copyright law a separate request must be submitted for each item. Accurate and complete information about the item and the patron making the request are essential to processing requests. Any request may be cancelled and returned if it lacks sufficient information to be processed. By submitting a request patrons acknowledge their acceptance of document delivery policies, fees, and copyright laws.

Requests are processed in the order in which they are received. Five requests are processed per patron per day. Additional requests per patron will be processed as the workload permits.

Rush Requests

Rush options for document delivery will be left to the discretion of each library. Costs for rush requests are fixed. A full explanation may be found under the "Fees" section.

Fees

Rush Requests

Not all libraries will offer rush services at all times. Cost for rush services, when available, are listed below. All rush requests submitted after 2:00pm will be processed the following business day.

Time frame	UofL faculty, staff and students	Non-UofL Local Professionals
Within three (3) working days	$10	$25
Next working day	$15	$30
Same working day (photocopies only)	$20	$35

Rush costs are independent of other fees. Rush delivery can never be guaranteed. If material cannot be obtained within the specified time frame, rush fees will not be charged.

Contacts

If you have any questions please contact Kathy Rogers at (502)852-5769 on the Health Sciences Campus or Andrew Huff (502)852-8751 on the Belknap Campus.

Abuse of these policies may result in the suspension or revocation of interlibrary loan/document delivery privileges.

Revised 8/5/2011

- Distance Learning Library Services
  http://louisville.edu/library/ekstrom/research/distance/
- Other library access: The University of Louisville is part of a consortium called the Metroversity. One of the benefits of membership is reciprocal borrowing privileges among the libraries. Two other members include Louisville Presbyterian Seminary which offers a Master of Arts in Marriage and Family Therapy and Spalding University which offers a Master of Social Work.

Strengths and Concerns

Research services such as one-on-one research appointments with librarians and library instruction classes have been well-utilized by students. In addition, the STEM and psychology research guides on the library web page are popular for research. A neuroscience research guide would be created before students enroll. Also, the number of databases and electronic resources available to students and faculty with a STEM-health focus is a strong point. However, one major area of concern is the library's flat budget and the inflationary increase in the cost of library materials. We have tried our best to maintain database and journal subscriptions, however some cancelations have been made, and new subscriptions deferred to get expenditures in line with the budget.

UNIVERSITY OF
LOUISVILLE.

Suzanne Meeks, Ph.D.
Professor and Chair
Department of Psychological
and Brain Sciences

INTEROFFICE MEMORANDUM

TO: PAUL DEMARCO, PROFESSOR, PSYCHOLOGICAL & BRAIN SCIENCES
FROM: SUZANNE MEEKS, CHAIR, PSYCHOLOGICAL & BRAIN SCIENCES
SUBJECT: BACHELOR OF SCIENCE IN NEUROSCIENCE PROPOSAL
DATE: JANUARY 23, 2017

Suzanne Meeks
Digitally signed by Suzanne Meeks
DN: cn=SuzanneMeeks, o=University of Louisville, ou=Psychological and Brain Sciences, email=smeeks@louisville.edu, c=US
Date: 2017.01.23 15:31:37 -05'00'

I am writing to convey the support of the Department of Psychological and Brain Sciences for the proposal for the Bachelor of Science in Neuroscience. We have made a Department-wide commitment to support growth in neuroscience. In addition to our existing excellent faculty (DeMarco, Sephton, Lyle, Pani, He, Petry) who do neuroscience-related work or teaching, and our new hire in imaging (Depue), we are committed to building our strength in this area with new faculty hires. We already have a number of basic and upper level neuroscience classes that we regularly offer, and the collaboration with ASNB will enhance and enrich the possibilities for undergraduates to develop a strong neuroscience background. This experience will include laboratory experiences on the HSC, something that is now difficult to coordinate. I believe there is a strong market for this degree, and that the graduates with the degree will be well-placed for immediate employment or further graduate or professional education. The proposal has been vetted by our Undergraduate Committee and approved unanimously by the Department faculty. I wish you the best of luck in moving this proposal forward.

University of Louisville • Louisville, KY 40292
P: 502.852.6068 **F:** 502.852.8904 **E:** smeeks@louisvile.edu **W:** www.louisville.edu/a-s/psychology

UNIVERSITY OF LOUISVILLE
SCHOOL OF MEDICINE

William Guido, Ph.D.
Office of the Chair
Department of Anatomical Sciences and Neurobiology
511 S Floyd St
Louisville, KY 40202
P: 502.852.6227
F: 502.852.6228
E: william.guido@louisville.edu
http://louisville.edu/medschool/anatomy

February 19, 2017

Dear Dr. DeMarco

I am writing to convey the strong support of the Department of Anatomical Sciences and Neurobiology for the proposal pertaining to the Bachelor of Science in Neuroscience. The proposed program was fully vetted and approved by our department curriculum committee and received unanimous support from our faculty. We as a department are fully committed to the design, implementation, and execution of this program. We have a robust research and graduate program in neuroscience, and in addition to advanced course work, our faculty can offer a unique laboratory experience for undergraduates. We are also aware that students may require additional attention and we are prepared to take measures to ensure their successful advancement through the program. The collaboration with the Department of Psychological and Brain Sciences will provide a strong foundational base with a laboratory experience. Neuroscience is the fastest growing undergraduate major nationwide, and students who graduate with this degree are well positioned for professional educational opportunities and advanced employment. As you know, I have worked closely with you to design a unique program that will bring both campuses together to offer students and enriched experience in an emerging and contemporary scientific discipline.

Sincerely,

William Guido.

William Guido, Ph.D.
Professor and Chair

UNIVERSITY OF
LOUISVILLE.

Toni M. Ganzel, MD, MBA
Interim Executive Dean of Health Affairs
Dean of the School of Medicine
Professor of Otolaryngolgy

May 17, 2017

Dr. Paul DeMarco
Associate Dean
University of Louisville
Department of Psychology

Dear Dr. DeMarco:

I am writing to convey my strong support for the new undergraduate program offering a Bachelor of Science degree in Neuroscience. The proposed program was reviewed and approved by the department curriculum committee as well as the office of Graduate Studies and Postdoctoral Affairs at the School of Medicine.

The collaboration between Anatomical Sciences and Neurobiology with the Department of Psychological and Brain Sciences will provide an excellent learning opportunity with a unique blend of course work and laboratory experience. To assist in this endeavor, my office will provide stipends for a graduate student teaching assistantship. This exciting initiative should increase enrollment at U of L and provide graduates with an enriched educational opportunity to better prepare them for admission to Medical School.

Sincerely,

Toni M. Ganzel

Toni M. Ganzel, M.D., M.B.A.

William Guido, M.D., Ph.D.
Chair
Anatomical Sciences and Neurobiology

To: Professor Paul DeMarco
Psychological & Brain Sciences

From: Kimberly Kempf-Leonard
Dean

Kimberly Leonard

August 11, 2017 (Revised)

I am delighted to know that the proposed Bachelor of Science in Neuroscience, which will be co-directed by the Departments of Psychological and Brain Sciences (PBS) and Anatomical Sciences and Neurobiology (ASNB), has been receiving positive feedback and support from constituent groups on campus. Neuroscience is a popular major at many universities, so this program will be a significant addition to the degree offerings and should attract many new students to the University of Louisville.

The College of Arts & Sciences will commit resources to cover one new graduate teaching assistant to support instruction in the program. The College also will assure that Math has an additional term faculty to cover the added burden of growing the Cardinal Core for a larger student body. I understand that the GTA will not be necessary until the second year of the program, but then will be provided annually. The program will require several classes in departments within the Division of Natural Sciences and Mathematics, all of which should be able to accommodate the enrollment of the new students.