ILLINOIS

Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Proposal to Establish a New Bachelor of Science in Liberal Arts and Science Degree (BSLAS) in Brain and Cognitive Science, in the Department of Psychology, College of Liberal Arts and Sciences

SPONSOR: Wendy Heller, Head, Department of Psychology, 217-244-8249, w-heller@illinois.edu

COLLEGE CONTACT: Kelly Ritter, Associate Dean, 217-333-1350, **ritterk@illinois.edu**

BRIEF DESCRIPTION: The BSLAS in Brain and Cognitive Science is a flexible, interdisciplinary program for students who plan to pursue technical or professional careers in areas such as intelligent information processing, artificial intelligence, telecommunications or robotics. The major allows students to combine the study of psychology, neuroscience, computer science, philosophy, linguistics, and related fields to gain novel but integrated perspectives on information and intelligence, both biological and artificial.

The major is structured to first introduce students to the field of brain and cognitive science, where they will receive an introduction to some of the many disciplines that the major includes. Students can then select from a variety of options for intermediate and upper level courses in a number of departments. The major culminates with a capstone seminar for seniors. Along the way, students will gain a knowledge of statistics, programming, and laboratory skills, all of which are highly relevant to current industry, business, and scholarship.

JUSTIFICATION: The study of how humans interact with, process, and understand information is increasingly important and promises only to become more critical with the exponential growth of the internet, "big data", smart devices, robotics and other computing technology. Many of our major competitors, such as MIT, UCSD, Indiana, UC Berkeley and others, have Cognitive Science or Brain and Cognitive Science programs. Undergraduate students at Illinois are already devising versions of this major by combining an intradisciplinary psychology concentration with courses in computer science, linguistics, cognitive and/or behavioral neuroscience or philosophy. The new major will meet the needs of these students, and we anticipate will also attract many new students to the University of Illinois. Evidence for such interest can be inferred from the explosive growth of the Brain and Cognitive Science major at UCSD (680 majors in 2015 but 1,434 in 2017).The growth at UCSD is a function of very recent technological successes related to the study of the brain and cognitive science. These include machine

learning advances (AI now "works") such as speech recognition, robotics, and self-driving cars, as well as the increasing importance of human-computer interaction to the many issues involving design.

While the new major includes many Psychology courses, it is different from the current Psychology major in its emphasis on machine learning, artificial intelligence and computer programming and in its breadth across several departments in LAS where these new techniques are now being used. The new major will address student interest in educational domains that currently are relatively untapped or under-developed at the undergraduate level in LAS, such as neuroscience (including cognitive, behavioral, social and developmental neuroscience), computational approaches to behavioral data, and neurotechnology, including human-computer interaction.

A critical component of the new Brain and Cognitive Science major are courses in computer programming. One option we considered is a CS+X degree. Computer science courses are, however, currently full to capacity, and the CS+X degree not only requires a significant number of CS classes but also two calculus classes and a course in matrix theory. The programming and mathematics skills that are required for the Brain and Cognitive Science major are not as extensive, which reflects the many changes in learning how to program that have occurred over the last decade. Instead of the CS+X approach, the Brain and Cognitive Science major will rely on the development of programming courses in languages such as Python. These courses will be taught primarily by two new tenure-track faculty, Assistant Professor Jon Willits and Assistant Professor Jessica Montag, who have been hired in the areas of Cognition and Cognitive Development to support this major. No computer programming courses will be required beyond these Python courses.

The idea for the BCOG major was generated by a small group of faculty who took it to the department advisory committee for discussion and support. The department head charged a committee of faculty to more fully develop the idea. A subcommittee of that group then wrote the initial draft of the formal proposal for the major, which was subsequently reviewed and approved by the department curriculum committee. Learning outcomes and assessment for the new major will follow the same processes used for our existing psychology major.

BUDGETARY AND STAFF IMPLICATIONS:

1) Resources

      a. How does the unit intend to financially support this proposal?

         The existing infrastructure in the Psychology Department is sufficient to support this program for the next several years in its entirety Assistant Professor Jon Willits and Asssistant Professor Jessica Montag will be teaching the new core courses in the major. The Department of Psychology is currently searching for a tenure-track Assistant Professor in Behavioral Neurosience

(anticipated start date of Fall 2019) who will also contribute to the courses in the major.

b. How will the unit create capacity or surplus to appropriately resource this program? If applicable, what functions or programs will the unit no longer support to create capacity?

The Psychology Department has hired two new faculty and are currently searching for a third faculty member to provide instructional support for the new major (BCOG 100, 200, 458, and 492). Furthermore, the department already teaches many courses applicable to this major. We have determined that these courses have the capacity to expand their enrollment and that existing classroom space will be sufficient. If necessary, new sections can be added to existing courses in the Psychology Department with current resources. For other departments with courses that can be used for the new major, please see the attached acknowledgements from the department heads. No functions or programs will be terminated or reduced in scope to accommodate the program. The current advising staff are sufficient to handle the anticipated 50-100 majors in this new major.

c. Will the unit need to seek campus or other external resources? If so, please provide a summary of the sources and an indication of the approved support.

At this time, the Department of Psychology is not seeking additional resources.

d. Please provide a letter of acknowledgment from the college that outlines the financial arrangements for the proposed program.

Please see attached.

2) Resource Implications

a. Please address the impact on faculty resources including the changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc.

We expect 50-100 students to declare in the first year of the major and for this number to grow gradually as the program becomes more widely known. Initially, we anticipate that majors will be comprised of a mix of students already enrolled at Illinois, primarily psychology majors, and new students drawn to the University of Illinois by the new BCOG major. Over the first few years of the program, we expect the ratio of already enrolled students to new freshman to decline as the number of new freshman gradually increases.

We expect that some students will transfer from concentrations within the current Psychology major to the Brain & Cognitive Science major. As addressed in 1b, we have hired two new faculty and are in the process of searching for a third faculty member who will be teaching courses within the new major.

There will not be a change in faculty teaching loads, since many of the classes in the major are slightly under-enrolled currently. This is because the largest demands for Psychology courses currently are in the areas of clinical/community, organizational, social and personality psychology. These areas are closely associated with job opportunities either in the medical/counseling field or in business and Illinois is known to have top programs associated with them. Despite being extremely strong, other program areas of Psychology, such as Cognitive Psychology, Cognitive Neuroscience, Behavioral Neuroscience, and Attention & Perception are under-enrolled due to the lack of an explicit major in either neuroscience or brain and cognitive science. As a result Illinois does not attract as many of these students. Thus, both lecture and lab courses in these areas have enough seats available to accommodate the expected number of new majors in Brain and Cognitive Science for at least several years.

Further, many of the course selections for the new major at both the introductory, intermediate and advanced levels are in departments outside of Psychology. This reflects both the diversity of interest in the new major as well as a goal of providing students with a multi-disciplinary breadth in brain and cognitive sciences. The large number of course options means there will be adequate space to accommodate the additional majors. Given nationwide trends, we hope that these courses could be close to capacity with the addition of this new major.

b. Please address the impact on course enrollment in other units and provide an explanation of discussions with representatives of those units.

We expect the new major to increase course enrollments in other departments within LAS, including Philosophy, Anthropology, Molecular and Cellular Biology as well as in the Computer Science Department in the College of Engineering. Please see the attached emails from these departments in support of Brain and Cognitive Science students enrolling in those courses.

c. Please address the impact on the University Library

The impact will not be above and beyond normal library business practices. Please see attached letter

d. Please address the impact on technology and space (e.g. computer use, laboratory use, equipment, etc.)

The existing lab classes in the Psychology Department can be expanded relatively easily to accommodate the additional students. These classes use either the two general purpose computer labs within the department, or specialized laboratory classrooms. In addition, two iFLEX classrooms have been created within the building. One of these is already used for the laboratory in cognitive neuroscience that is a recommended lab class for the new major. The new computer programming course that will be developed is going be structured around the small group projects that are the heart of not only the iFLEX approach to instruction but also the approach used in design courses.

For the new faculty that have been hired by the Psychology Department to support the Brain and Cognitive Science major, we will be creating a small computational cluster which will be housed either within the department or at the Advanced Computation Building. We will also be making use of the computer clusters and data storage facilities that are available through ATLAS. The new faculty have also been given sufficient lab space for their research within the Psychology Building. This space is being upgraded to support the level of technology that they will employ. This will include upgrades to the electrical system and other infrastructure within the building. In general, the Psychology Department will be able to completely support the technology and space needs of the faculty and students that the new major has and will, respectively, bring to campus.

For new degree programs only:

3) Briefly describe how this program will support the University's mission, focus, and/or current priorities. Include specific objectives and measurable outcomes that demonstrate the program's consistency with and centrality to that mission.

The Brain and Cognitive Science major supports the University's mission, focus and current priorities in several ways. It represents cutting edge scholarship that will help situate the campus to have national and international prominence in priority domains such as health care and related topics (e.g., neuroscience, technology, human-computer interaction, health disparities, and social and behavioral determinants of health). These research areas also represent rich intersections across multiple campus units where interdisciplinary work already flourishes or where such work could readily be developed.

The new major helps fulfill a recommendation by the campus-wide Health Science Strategy Task Force to create "New majors, minors, and professional programs that leverage our current campus strengths in engineering, computation, and analytics and other impact area strengths to create unique skill sets that prepare students for careers in healthcare innovations…" The Task Force also noted that "that the commitment to human health and well-being is not limited to the basic biomedical and applied health sciences, but is shared as well by the arts, humanities, and others. Commitment to

having an impact on human health and well-being can be a powerful uniting force that allows Illinois to achieve new levels of local, national, and global impact." The new major would also provide some of the necessary support for the combination of computational artificial intelligence and health data analytics that has been proposed by the task force.

The Brain and Cognitive Science major helps maintain the university's reputation as one of the two top places (along with UCSD) in the US for research in psycholinguistics and one of the top three in the world (adding the Max Planck Institute for Psycholinguistics). The hiring of the new faculty will help us not only maintain that top ranking but move the university forward in psycholinguistics research using the latest techniques. This has been recognized by the Department of Linguistics, which is one of the strongest supporters of the new major. In addition to linguistics, the Brain and Cognitive Science major will allow the cognitive psychology program area to expand in new and important directions that will not only help maintain the top 10 ranking of the Psychology Department, but move it in new and innovative directions to meet the social and techological challenges of the next decades.

This new, interdisciplinary major also will help the university in the creation of successful programs for the new Siebel Design Center. As has been the case at other institutions, successful technology-driven design programs have at their core the combination of design with artificial intelligence, human factors, psychology, and human-computer interaction. The Brain and Cognitive Science major is structured to provide the cross-cutting thread that ties engineering with design. The new major will leverage the expertise that is available on campus and help to catalyze critical advances in this domain.

Furthermore, this new major intersects with a broad emphasis on campus on neuroscience and will be synergistic with an LAS effort to create an undergraduate neuroscience major. A prominent trend both nationally and internationally is the increasing focus on biological and brain mechanisms and their role in human behavior, reflected in funding priorities at the National Institute of Mental Health (NIMH), former President Obama's BRAIN initiative, the European Commission's Human Brain Project, Japan's Brain/MINDS project, Australia's AusBrain, and others. A new Center for Brain Plasticity on campus provides a hub for basic and translational research that will promote interdisciplinary studies of the neurobiological foundations of brain plasticity. In keeping with these trends and initiatives, the Psychology Department was recently granted approval to hire in the area of Behavioral Neuroscience in the area of learning, memory, and neural plasticity. These topics will all be fundamental to the new major in Brain and Cognitive Science and new courses will be added to that rubric. The School of Molecular and Cellular Biology was also given approval to hire in the area of brain plasticity, providing complementary expertise and new courses that will also be relevant to the major. These diverse but intersecting trends and initiative on campus add up to an exciting and powerful direction for Illinois.

Assessment of learning outcomes for the Brain and Cognitive Science major will follow the same processes used to evaluate the Psychology major. The four primary learning outcomes are: a) students will demonstrate fundamental knowledge and comprehension of the major concepts, theoretical perspectives, historical trends, and empirical findings to discuss how theoretical principles apply to brain, cognitive and behavioral phenomena; b) students will develop scientific reasoning and problem solving skills, including effective research methods; c) students will develop ethically and socially responsible behaviors for professional and personal settings in a landscape that involves increasing diversity; and, d) students will be prepared to apply brain and cognitive science-specific content and skills, effective self-reflection, project-management skills, teamwork skills, and career preparation to optimize their competitiveness for securing places in a graduate school, professional school, or in the workforce. These outcomes were fashioned to align well with the with the five campus learning outcomes. Outcomes will be assessed, under the guidance of the department curriculum and advisory committees, via a three prong strategy: (1) surveys that allow students to self appraise how their training as a brain and cognitive science major prepared them in each of the four learning outcome domains; (2) vignette based pre- / post- assessment of knowledge and skills in the first 3 of our 4 learning outcome domains; and, (3) incorporation of CITI ethics training / evaluation into the major's capstone course.

4) Please provide an analysis of the market demand for this degree program. What market indicators are driving this proposal? What type of employment outlook should these graduates expect? What resources will be provided to assist students with job placement?

While there are vast numbers of students who are interested in going to college to study neuroscience, biology, psychology, industry, engineering, and their intersections, Illinois does not have the reputation for being a top undergraduate neuroscience program. A search for undergraduate neuroscience programs yields a listing of the top ten that includes Brown, Johns Hopkins, MIT, Middlebury College, Tulane University of Oklahoma, UCLA, University of Pennsylvania, USC, Vanderbilt, and Washington U in St. Louis. Illinois also does not come up on lists of schools with Brain and Cognitive Science, or Cognitive Science programs. The reason Illinois is not on these lists is NOT because the expertise, courses and resources on this campus to support a strong curriculum are lacking. It is because we do not have a clearly stated, explicit and identifiable program. One of our faculty, Prof. Gary Dell (elected to the National Academy of Sciences, recently appointed Professor in the Center for Advanced Study) has been involved in a number of external reviews of Brain and Cognitive Science programs around the country. He estimates that we could reasonably expect such a program to attract 300-500 new majors, who are not currently even considering Illinois as an option. Given the reputation of the faculty in our areas of cognitive psychology, and cognitive and behavioral neuroscience, there is no reason Illinois should not be attracting many of these students. This new major should help to address that disconnect.

The administrators of the new Carle-Illinois College of Medicine (CI-MED) have also noted the importance of creating new programs that provide training compatible with pre-med training in other fields. While this major is not intended as a stand alone pre-med major, it would fit very well with the type of background and training they will be looking for in their applicants. Students graduating with this major would also be potential applicants to graduate schools in engineering, statistics, computer sciences, and linguistics, as well as being competitive for positions in all these areas. The demand in industry for this major is large and increasing, with companies such as Spotify, Apple, Microsoft, and Boeing planning to utilize the skills of graduates with training in this area. To assist students with job placement, the Psychology Advising Office staff will be given training in the opportunities provided by the new major. While the current staff can handle the initial influx of new majors, if the demand reaches the level found at other institutions, we will hire additional staff to support the students both in their academic and their post-academic careers.

5) If this is a proposed graduate program, please discuss the programs intended use of waivers. If the program is dependent on waivers, how will the unit compensate for lost tuition revenue?

N/A

DESIRED EFFECTIVE DATE: Fall 2019

STATEMENT FOR ACADEMIC CATALOG:

Psychology Overview Tab

Wendy Heller, Head of Department

315 Psychology Building, 603 East Daniel, Champaign
PH: (217) 333-0631

http://www.psychology.illinois.edu

Psychology is the scientific investigation of human and animal behavior. Psychologists study behavior in systems ranging from single cells to the individual person, from small groups of people to communities. Psychologists strive to describe behavior and to understand its underlying biological and social mechanisms. This enterprise, designed to better understand the human condition, accumulates knowledge that can help solve problems faced by individuals and by communities. Students that graduate with a major in psychology acquire a wide range of knowledge and useful skills that allows them to find employment in many different areas.

The Department of Psychology offers two majors- BSLAS in Psychology and BSLAS in Brain & Cognitive Science.

The **Brain and Cognitive Science major** introduces the student to a simple question: How do intelligent systems work? Our world provides two examples of complex intelligent systems—human beings (and possibly some other animals) and intelligent computer systems. Brain and Cognitive Science majors investigate the brain and behavior of intelligent biological systems (e.g. people) from the perspective that the brain is a kind of computer. Consequently, students must learn about how brains and computers work, and how these can explain what we know about mental functions including perception, learning, memory, and language. Brain and Cognitive Science majors make use of discoveries from a number of different disciplines, including psychology, neuroscience, computer science, linguistics, philosophy, and anthropology, and has applications to the development of technology in education, health, language sciences, and design.

The Brain and Cognitive Science major provides fundamental training in psychology, neuroscience, and computation, and it allows a great deal of flexibility with regard to more advanced courses. The major requires training in statistics, a laboratory course, and the capstone course. Students should contact our Undergraduate Advising Office for help in creating a plan of study and research that best meets their goals and interests.

The **Psychology major** is a broad-based curriculum within a research-focused department. The program is designed both for students interested in a liberal arts education with psychology as a focal area and for students who plan to attend graduate or professional school either in psychology or in a different field such as medicine, law, social work, business administration, counseling, labor relations and many others. Areas of interest in

psychology, and many of these are reflected in the similarly-titled concentrations that are available within the Psychology major:

- Behavioral Neuroscience is the study of the biological mechanisms underlying behavior. Biological psychologists generally are interested in the brain and the nervous system, in the endocrine system, and in other organismic processes.
- Clinical psychology is the study of problems encountered by individuals, groups, and families — especially problems involving psychopathology. Clinical psychologists are interested in the application of psychological knowledge and techniques for the alleviation of these problems.
- Community psychology is the study of the social processes and problems of groups, organizations, and neighborhoods, and the development and evaluation of progress for social change and social policy based on psychological understanding.
- Cognitive neuroscience is concerned with understanding the neuroscientific bases of cognition. Various methods are employed to assess the roles of different brain systems in psychological functions such as memory, attention, language, executive control, decision making, response processing, and emotion.
- Cognitive psychology is the study of basic behavioral and cognitive processes, including learning, memory, problem-solving, motivation, and language.
- Developmental psychology is the study of intellectual development, emerging personality, and the acquisition of language, as well as psychophysiological and social development processes as individuals develop from birth through old age.
- Engineering psychology is the study of human behavior in the context of interactions between humans and machines.
- Organizational psychology is the application of techniques of assessment, prediction, and intervention to areas of human resources in organizations, including, but not limited to, standard personnel selection and training, attitude assessments and interventions, and program evaluations.
- Personality psychology focuses on individual behavior. It is the study of ways to understand and describe an individual's behavior and to predict an individual's future behavior.
- Quantitative psychology specialists develop mathematical models of psychological processes and devise methods for quantitative representation and analysis of data about behavior. These are used in the study of differences between individuals in ability, personality, preferences, and other psychological phenomena.
- Social psychology is the study of attitudes, social perception and cognition, interpersonal relations, interpersonal interactions, and social and cultural factors affecting human behavior.
- Visual cognition and human performance is the study of attention, visual perception, visual memory, and human performance. Visual cognition research uses tools drawn from cognitive psychology and cognitive neuroscience to better understand how visual information is perceived and remembered.

Prescribing Psychologists:

The states of Illinois, New Mexico and Louisiana now allow appropriately qualified psychologists to write prescriptions for psychotropic medications, if they have the necessary training. There are many other states that currently have pending prescriptive authority legislative initiatives. One component of becoming a prescribing psychologist is completion of the following undergraduate courses:

- 2-semester course sequence in chemistry or biochemistry with lab

- 1 semester microbiology with lab

- 1 semester general biology for science majors

- 1 semester physiology

- 1 semester human anatomy

- 1 semester physiology and anatomy

- Medical terminology (class or proficiency)

For more information on becoming a prescribing psychologist and a detailed list of which courses meet these requirements, please consult with one of the academic advisors in psychology.

MAJOR TAB

The Department of Psychology offers the following majors:

Brain and Cognitive Science- provides fundamental training in psychology, neuroscience, and computation, and it allows a great deal of flexibility with regard to more advanced courses. The major requires training in statistics, a laboratory course, and the capstone course

Psychology - provides both depth and breadth of knowledge in Psychology. The major consists of an introductory course, a statistics course, a breadth of knowledge or foundation in the different areas of psychology that comes from a set of core courses, a research methods course, and elective courses that give students a depth of knowledge. Each concentration, except for intradisciplinary psychology, has a core course specific to that area of psychology with a research methods course designed for that concentration. In formulating their Plan of Study, students can decide either to undertake a concentration in Intradisciplinary Psychology and select courses that focus on their own unique interests or to specialize in a particular area of Psychology by fulfilling the requirements for one of the other concentrations listed below. As undergraduate students fulfill the requirements, they also have the opportunity to participate in current research projects by

working in labs. Students should contact our Undergraduate Advising Office for help in creating a plan of study and research that best meets their goals and interests.

Concentrations within the BSLAS in Psychology

- Intradisciplinary Psychology
- Behavioral Neuroscience
- Clinical/Community Psychology
- Cognitive Neuroscience
- Cognitive Psychology
- Developmental Psychology
- Diversity Science
- Organizational Psychology
- Personality Psychology
- Social Psychology

Departmental Distinction

To be eligible for graduation with Distinction in Psychology, a student must complete a two-semester research sequence in PSYC 494, submit a Senior Thesis that must be approved by the department, and maintain an overall 3.0 GPA at the time of submission. A student can also enroll in PSYC 492 to facilitate the preparation of a Bachelor's thesis.

To be eligible for High or Highest Distinction, a student must first be admitted to the Honors Program (requirements: junior standing, 3.5 GPA in Psychology overall, and completion of the statistics an laboratory requirements). The student then has to complete the three semester Honors sequence (PSYC 398, PSYC 498, PSYC 499), submit a Senior Thesis that must be approved by the department, and maintain an overall GPA of at least 3.0 to be awarded High Distinction or a GPA of 3.5 for Highest Distinction.

Academic Advising

The Psychology Undergraduate Advising Office is open to help students choose patterns of courses relevant to their interests, as well as to help students explore graduate school, professional school, and career options. Advising is done by an award-winning staff of academic professionals along with mentoring by faculty for students with research interests. Peer registration assistants are also available to help with the registration process.

Website for BSLAS in Brain and Cognitive Science:

For the Degree of Bachelor of Science in Liberal Arts and Sciences

Major in Brain and Cognitive Science
E-mail: bcog-advising@illinois.edu

Students must meet the requirements listed below. Minimum required course work equates to 42 hours of Brain and Cognitive Science courses, including at least 12 hours of advanced coursework. Please see your academic advisor. A Major Plan of Study Form must be completed and submitted to the LAS Student Academic Affairs Office before the end of the fifth semester (60-75 hours).

Twelve hours of 300- and 400-level courses must be taken on this campus.

Minimum hours required for graduation is 120. Students will complete 40 hours of upper-division coursework (these hours can be drawn from all elements of the degree).

Students must also complete the Campus General Education requirements including the campus general education language requirement.

BCOG 100 Intro to Brain and Cognitive Science	**3**
BCOG 200 Intro to Programming for Brain and Cognitive Science	**4**
Statistics Course PSYC 235 Intro to Statistics (or equivalent)	**4**
Multi-disciplinary Breadth Courses Select two classes from the following (a complete list is available from the BCOG Advising Office): ANTH 101 Intro to Anthropology *OR* ANTH 102 Human Origins & Culture *OR* ANTH 104 Talking Culture *OR* ANTH 143 Biology of Human Behavior INFO 102 Little Bits to Big Ideas *OR* CS 125 Intro to Computer Science LING 100 Intro to Language Science MCB 170 Society and the Brain PHIL 100 Intro to Philosophy-ACP *OR* PHIL 101 Intro to Philosophy PHIL 102 Logic and Reasoning *OR* PHIL 103 Logic and Reasoning	**6-7**

PSYC 100 Intro to Psychology or PSYC 103 Intro to Experimental Psychology	
Intermediate Required Courses, Select one of the following: PSYC 220 Images of Mind PSYC 204 Intro to Brain and Cognition PSYC 210 Behavioral Neuroscience	**3**
Intermediate Elective Courses, Select one of the following: ANTH 240 Biological Anthropology ANTH 243 Society of the Great Apes ANTH 270 Language in Culture CS 173 Discrete Structures or MATH 213 Basic Discrete Mathematics CS 225 Data Structures PSYC 224 Cognitive Psychology PSYC 248 Learning and Memory PSYC 230 Perception and Sensory Processes PSYC 216 Child Psychology LING 270 Language, Technology, and Society LING 225 Language, Mind, and Brain PHIL 202 Symbolic Logic PHIL 250 Conceptions of Human Nature PHIL 270 Philosophy of Science	**3**
BCOG 458 Advances in Brain and Cognitive Sciences	**3**
Required Lab, Select one of the following: PSYC 311 Behavioral Neuroscience Lab PSYC 334 Perception Lab PSYC 445 Cognitive Neuroscience Lab PSYC 331 Cognitive Psychology Lab PSYC 363 Developmental Child Psychology Lab PSYC 489 Neural Nets Modeling Lab	**4**

Advanced Electives, Select four of the following:	**12**
ANTH 372 Topics in Language & Culture	
BCOG 492 Cognitive Science Capstone	
CS 361 Probability & Statistics for Computer Science	
CS 440 Artificial Intelligence	
IB 329 Animal Behavior	
IB 432 Genes and Behavior	
IE 340 Human Factors	
LING 301 Elements of Syntax	
LING 302 Elements of Phonology	
LING 304 Elements of Morphology	
LING 307 Elmnts Semantics and Pragmatics	
LING 425 Intro to Psycholinguistics or PSYC 425 Psych of Language	
MCB 419 Brain, Behavior and Information Processes	
MCB 462 Integrative Neuroscience	
PHIL 407 Logic and Linguistic Analysis	
PHIL 425 Philosophy of Mind	
PHIL 430 Theory of Knowledge	
PHIL 443 Phenomenology	
PHIL 453 Formal Logic and Philosophy	
PHIL 454 Advanced Symbolic Logic	
PHIL 471 Contemporary Phil of Science	
PHIL 477 Philosophy of Psychology	
PSYC 302 Applied Neuroscience	
PSYC 351 Thinking and Reasoning	
PSYC 356 Evolution of Mind	
PSYC 361 The Psychology of Aging	
PSYC 402 Intro Clin Neuropsych	
PSYC 403 Memory and Amnesia	
PSYC 404 Cognitive Neuroscience	
PSYC 408 Human Behavioral Genetics	
PSYC 413 Psychopharmacology	
PSYC 414 Brain, Learning, and Memory	
PSYC 421 Principles of Psychophysiology	
PSYC 423 Language Acquisition	
PSYC 433 Evolutionary Neuroscience	
PSYC 450 Cognitive Psychophysiology	
PSYC 451 Neurobio of Aging	
PSYC 453 Cognitive Neuroscience of Vision	
SHS 301 General Speech Science	
SHS 427 Language and the Brain	
Total Hours	**42-43**

CLEARANCES:

Signatures:

Wendy Heller

_____   ___9/24/18_____

Unit Representative: Date:

Kelly Right

_____   _____

College Representative: Date:

2-4-19

Appendix A
Assurances from Departments with Courses Listed

Sample Email Requesting Assurances

CONTENTS OF EMAIL:

Dear DEPARTMENT HEAD,

I'm writing to introduce a new major in Psychology and to ask for your support.

The proposed BSLAS in Brain and Cognitive Sciences (BCOG) is a flexible, interdisciplinary program for students who plan to pursue technical or professional careers in areas such as intelligent information processing, artificial intelligence, multimedia design, telecommunications or robotics. The major allows students to combine the study of psychology, neuroscience, computer science, philosophy, linguistics, and related fields to gain novel but integrated perspectives on information and intelligence, both biological and artificial.

The major is structured to first introduce students to the field of brain and cognitive science, and allow them to receive an introduction to some of the many disciplines that the major includes. Students can then select from a large number of options for intermediate and upper level courses in a variety of departments. The major culminates with a capstone seminar for seniors. Along the way, students will gain a knowledge of statistics, programming, and laboratory skills.

Our proposed curriculum is listed in the attached proposal to the Senate Educational Policy Committee. We hope that you will be willing to support us and our students in this exciting new major. If so, would you please let us know that BCOG students are welcome to enroll in the courses from your department? This is not a request for any formal change—our students would register and take their chances on getting into the class like any other student—but rather an assurance that they are welcome to do so. We anticipate that the new major would benefit your department by increasing enrollments in the selected courses.

For your convenience, I have listed the set of courses in your department which we would like to include among the recommended course options for the new major.

I look forward to hearing from you.

Best,
Wendy

Anthropology
---------- Forwarded message ---------
From: **Farnell, Brenda M** <bfarnell@illinois.edu>

Date: Tue, Sep 18, 2018 at 2:32 PM
Subject: Re: new major in Psychology
To: Heller, Wendy <w-heller@illinois.edu>, Greenberg, Jessica R
<jrgreenb@illinois.edu>
Hello Wendy:

Anthropology is very pleased to support the proposal for a new major in physcology in
Brain and Cognitive Sciences (BCOG). We look forward to welcoming these students to
our classes - those listed and many others in our course offerings that are sure to be of
interest.

Sincerely,

Brenda

Brenda Farnell, Ph.D
Professor and Head
Department of Anthropology
Affiliate Faculty American Indian Studies
University of Illinois at Urbana-Champaign
http://www.anthro.illinois.edu/people/bfarnell

Co-Editor, Journal for the Anthropological Study of Human Movement (JASHM)
http://jashm.press.illinois.edu/

Computer Science

---------- Forwarded message ---------
From: Pitt, Leonard B <pitt@illinois.edu <mailto:pitt@illinois.edu> >
Date: Mon, Sep 17, 2018 at 6:18 PM
Subject: Re: New major in Psychology
To: Heller, Wendy <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >
Cc: Adve, Vikram Sadanand <vadve@illinois.edu <mailto:vadve@illinois.edu> >,
Gunter, Elsa <egunter@illinois.edu <mailto:egunter@illinois.edu> >

Dear Wendy,

As I understand your request, you are not asking for comments on the contents of the
degree program, or a letter endorsing it (which would require a deeper review here).
Rather, you are simply asking whether the CS department is okay with students in your
new degree program enrolling in the courses you listed below, as seats may be available.
In particular, these are not required courses for your students, and you are not requesting
that students in the new program be given priority registration.

If I am incorrect in these impressions, please let me know.

With the above understanding, I do not see any reason why students in this program are not welcome to enroll as they are able, and we'd be happy to provide such a letter. Perhaps this email will suffice.

I should note that Elsa Gunter is now the Director of Undergraduate Programs and overseeing our courses and registration, so I'm cc'ing her so she is aware of this new program.   Any future correspondence should be with Elsa.

Sincerely,

-Lenny

Industrial Engineering

From: "Nagi, Rakesh" <nagi@illinois.edu <mailto:nagi@illinois.edu> >

Subject: Re: New major in Psychology

Date: October 24, 2018 at 12:14:19 PM CDT

To: "Heller, Wendy" <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >, "Sowers, Richard B" <r-sowers@illinois.edu <mailto:r-sowers@illinois.edu> >, "Craddock, Heidi C" <hcraddoc@illinois.edu <mailto:hcraddoc@illinois.edu> >

Cc: "Aber, Mark S" <maber@illinois.edu <mailto:maber@illinois.edu> >, "Wooldridge, Abigail" <arwool@illinois.edu <mailto:arwool@illinois.edu> >, "Jones, Patricia Marie" <pmjones5@illinois.edu <mailto:pmjones5@illinois.edu> >, "Graddy, Shawna" <sgraddy@illinois.edu <mailto:sgraddy@illinois.edu> >, "Stolyar, Aleksandr" <stolyar@illinois.edu <mailto:stolyar@illinois.edu> >

Dear Wendy,
Thank you for sharing this exciting new major with us. I believe this will be very attractive to many students and should be a great success.

With this email I am expressing ISE's willingness to let IE 340 be listed as recommended course in this BS degree BCOG. I am also including the two recent and upcoming instructors (Patty Jones and Abigail Wooldridge, resp.) for their knowledge and comments. The exact details on number of students we can accommodate will be conveyed to you later by Rich Sowers, Assoc. Head for ISE UG programs and/or Ms. Heidi Craddock.

Wishing you the very best with this new degree!
Best,
Rakesh
Cc: ISE Advisory Committee Chair, Sasha Stolyar
ISE instructors for IE 34, Abigial Wooldridge and Patty Jones

Operations and long term teaching plan, Shawna Graddy.
--
Donald Biggar Willett Professor in Engineering and Department Head
Department of Industrial & Enterprise Systems Engineering
University of Illinois at Urbana-Champaign
117 Transportation Building, MC-238
104 South Mathews Avenue
Urbana, IL 61801
Email: nagi@illinois.edu <mailto:nagi@illinois.edu>
Web: http://rakeshnagi.ise.illinois.edu/
Tel: +1 (217) 244 3848   Fax: +1 (217) 244 5705

Informatics

---------- Forwarded message ---------
From: **Renear, Allen H** <renear@illinois.edu>
Date: Mon, Oct 29, 2018 at 11:57 AM
Subject: Re: Support for new Psych major
To: Heller, Wendy <w-heller@illinois.edu>

Ok, sure. I do own this course via my I3 role. Many apologies for delay.

 Allen H Renear, Dean and Professor

School of Information Sciences, University of Illinois--Urbana-Champaign

501 E Daniel, Champaign IL 61820 / ischool.illinois.edu

Skype:allenrenear; M: 217-390-9369 WeChat:Allen_Renear

Assistant: Christine Hopper, cmhopper@illinois.edu 217-244-5600

Integrative Biology

From: "Caceres, Carla E" <cecacere@illinois.edu <mailto:cecacere@illinois.edu> >

> Subject: Re: New major in Psychology, Time sensitive
> Date: October 24, 2018 at 6:29:30 PM CDT
> To: "Heller, Wendy" <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >
> Cc: "Aber, Mark S" <maber@illinois.edu <mailto:maber@illinois.edu> >

> Dear Wendy,

> SIB would welcome additional enrollments in IB329 and IB432 from the new
major in Brain and Cognitive Sciences.

If you need that statment on letterhead, please let me know.

Best wishes,
Carla

Linguistics

---------- Forwarded message ---------
From: Yoon, James <jyoon@illinois.edu <mailto:jyoon@illinois.edu> >
Date: Mon, Aug 20, 2018 at 10:04 AM
Subject: RE: FW: new major in Psychology
To: Heller, Wendy <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >

Wendy,

My undergrad advisors are happy to support this initiative and foresee no major issues with students using our classes to fulfill requirements.

Do you need a formal letter?

James

Molecular & Cellular Biology
---------- Forwarded message ---------
From: Milan Bagchi <mbagchi@life.illinois.edu <mailto:mbagchi@life.illinois.edu> >
Date: Tue, Aug 28, 2018 at 5:05 PM
Subject: Re: new major in Psychology
To: Heller, Wendy <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >
Cc: Bagchi, Milan K <mbagchi@illinois.edu <mailto:mbagchi@illinois.edu> >

Dear Wendy:

On behalf of the School of MCB, I assure you that your proposal for the Brain and Cognitive Sciences (BCOG) program has our strong support. The BCOG students are most welcome to enroll in the MCB courses you have listed below. Please let me know if I can provide any other help in this matter.

All the best,
Milan

Milan K. Bagchi, Ph.D.
Deborah Paul Endowed Professor
Director, School of Molecular and Cellular Biology
University of Illinois at Urbana-Champaign
534 Burrill Hall, 407 South Goodwin
Urbana, IL 61801

Philosophy

---------- Forwarded message ---------
From: Sanders, Kirk <ksanders@illinois.edu <mailto:ksanders@illinois.edu> >
Date: Mon, Sep 17, 2018 at 4:39 PM
Subject: Re: New major in Psychology
To: Heller, Wendy <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >
Dear Wendy,

I apologize profusely for the delay in getting back to you. This all looks fine to me. BCOG majors
are definitely welcome to enroll in all of the PHIL courses you list. (One exception: PHIL 473
Philosophy of Biology has been dropped from our curriculum, since we haven't been able to
staff it in years. I believe it's officially off the books as of this semester.)

All the best,

Kirk

Speech & Hearing Science

From: "Kirk, Karen" <kikirk@illinois.edu <mailto:kikirk@illinois.edu> >
Date: October 24, 2018 at 4:24:46 PM CDT
To: "Heller, Wendy" <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >
Subject: RE: New major in Psych, Time sensitive

> The FAC approved this request.
> Karen

From: Wendy Heller <w-heller@illinois.edu <mailto:w-heller@illinois.edu> >
Sent: Wednesday, October 24, 2018 11:59 AM
To: Kirk, Karen <kikirk@illinois.edu <mailto:kikirk@illinois.edu> >
Cc: Aber, Mark S <maber@illinois.edu <mailto:maber@illinois.edu> >
Subject: Re: New major in Psych, Time sensitive

Great, thanks, Karen. These are included as electives and it is hard to say
how many students will enroll. There are quite a few options for them to choose from and
of course it will take time for the new major to attract students. We hope to launch in Fall
2019 but don't expect to see a big surge. However, we do hope to capture students
interested in neuroscience and cognitive science who are currently going elsewhere.

The proposal is attached to this email.

Thanks for your prompt response!

Wendy

On Wed, Oct 24, 2018 at 11:42 AM Kirk, Karen <kikirk@illinois.edu <mailto:kikirk@illinois.edu> > wrote:

Hi Wendy,
I have a Faculty Advisory Committee meeting today. I will discuss it with them. Can you send the proposal?
Are these included as electives in the proposal? How many students do you anticipate might enroll? I will have to check on prerequisites for those classes.
Karen

Department of Bioengineering

From: **Insana, Michael** <mfi@illinois.edu>
Date: Fri, Feb 1, 2019 at 11:22 AM
Subject: RE: New major in Psychology
To: Heller, Wendy <w-heller@illinois.edu>

Dear Wendy:

I have spoken to Rashid, Martha, and several faculty from the Department of Bioengineering about your proposal. We feel it has very little impact on the educational programs in Bioengineering as described in your proposal, and therefore we have no objections to the BCOG UG program. We do think your program could benefit significantly from close cooperation with College of Engineering units, especially CS and BIOE given the technical aspects we could offer, and we hope it develops along those lines as you move forward. Please let me know if we can help you achieve your ambitious educational goals, since the initiative is certainly worthwhile for campus and the brain sciences community, and it is likely to garner interest from students.

Sincerely,
Michael Insana
Interim Head, Department of Bioengineering

University Library

Office of University Librarian and Dean of Libraries
230 Main Library, MC-522
1408 West Gregory Drive
Urbana, IL 61801

December 17, 2018

Kelly Ritter
Associate Dean for Curricula and Academic Policy
College of Liberal Arts and Sciences
2090 Lincoln Hall
702 South Wright St., MC – 448

Dear Prof. Ritter:

The University Library recently received a proposal from LAS to establish a BSLAS in Brain and Cognitive Science.

Based upon the documents we received, reviewed, and commented upon by three of our subject specialists, it is our belief that there will be no significant impact on collection development, instruction, or other operations in the University Library.

If additional services or materials are required as the programs further develop, we will be happy to discuss those needs as they emerge.

Sincerely,

John P. Wilkin
Juanita J. and Robert E. Simpson
Dean of Libraries and University Librarian

e-c: Paula Carns
        Amy Lawrence Elli
        Yali Feng
        Mary Schlembach
        Thomas Teper
        Kelli Trei

I ILLINOIS

COLLEGE OF LIBERAL ARTS & SCIENCES

Office of the Dean
2090 Lincoln Hall
702 S. Wright St.
Urbana, IL 61801

January 9, 2019

Kathryn Martensen
Associate Provost
Office of the Provost and Vice Chancellor for Academic Affairs
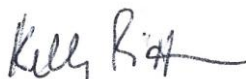207 Swanlund Administration Building
MC-304

Dear Kathy:

   The Committee on Courses and Curricula and Executive Committee on behalf of the Faculty of the College of Liberal Arts and Sciences has voted to approve the following proposal:

Establish a BSLAS in Brain and Cognitive Science

This proposal is now ready for review by the Senate Educational Policy Committee for a desired implementation of Fall 2019.

Sincerely,

Kelly Ritter
Associate Dean

enclosures
C: Professor Mark Aber
      Professor Wendy Heller