March 12, 2012

Dr. MacGregor M. Stephenson  
Assistant Commissioner for  
Academic Affairs and Research  
Texas Higher Education Coordinating Board  
1200 East Anderson Lane  
**Interagency Mail**

Dear Dr. Stephenson:

The University of Texas at Austin proposes to establish a Bachelor of Science degree in Neuroscience. The proposed degree is within the planning authority granted to the University by the Board of Regents and the Texas Higher Education Coordinating Board.

This proposal meets the criteria for review and approval by the Commissioner of Higher Education on behalf of the Coordinating Board. We therefore enclose a copy the certification signed on behalf of The University of Texas System Board of Regents. By copy of this letter, I am notifying the Counsel and Secretary to the Board of our approval.

Sincerely,

[Signature]

Pedro Reyes  
Ashbel Smith Professor of  
Education Policy  
Executive Vice Chancellor,  
ad interim

PR/smr  
Attachments  
c: President William Powers  
Dr. Steven Leslie  
Dr. Gretchen Ritter  
General Counsel to the Board of Regents Francie A. Frederick
February 21, 2012

Dr. Pedro Reyes  
Executive Vice Chancellor, ad interim  
Academic Affairs  
The University of Texas System  
OHH 304 (P4300)

Dear Dr. Reyes:

Enclosed for your approval is the following non-substantive academic change from the College of Natural Sciences, which was approved by the Faculty Council on a no-protest basis on January 30, 2012 and subsequently approved by the Office of the Executive Vice President and Provost.

- Addition of the Bachelor of Science in Neuroscience degree program in the College of Natural Sciences chapter of the Undergraduate Catalog, 2012-2014 (D 9429-9433).

I have enclosed the New Program Request Form for Bachelor’s and Master’s Degrees and the Certification Form for New Bachelor’s and Master’s Programs for your review and signature. Your help in forwarding the forms, once approved, to the Texas Higher Education Coordinating Board is appreciated.

Please let me know if you have any questions or need other information concerning these changes.

Sincerely,

[Signature]

Gretchen Ritter, Ph.D.  
Vice Provost for Undergraduate Education and Faculty Governance  
Professor of Government

GR: ars, enclosures

xc (letter only):
- William Powers, Jr., President of the University  
- Charles Roeckle, Deputy to the President  
- David Laude, Interim Dean, Natural Sciences  
- Kristi Fisher, Associate Vice Provost and Director, IMA  
- Brenda Schumann, Associate Registrar  
- Sue Greninger, Secretary, Office of General Faculty  
- Debbie Roberts, Office of General Faculty
Certification Form for New Bachelor’s and Master’s Programs
Texas Higher Education Coordinating Board

Directions: An institution shall use this form to request a new bachelor’s or master’s degree program that meets all criteria for automatic approval in Coordinating Board Rules, Chapter 5, Subchapter C, Section 5.44: (a) The program has institutional and governing board approval; (b) the program complies with the Standards for Bachelor’s and Master’s Programs; (c) adequate funds are available to cover the costs of the new program; (d) new costs during the first five years of the program will not exceed $2 million; (e) the program is a non-engineering program (i.e., not classified under CIP code 14); and (f) the program will be offered by a university or health-related institution.

If a new bachelor’s or master’s program does not meet the criteria above, an institution must submit a request using the Form for Requesting a New Bachelor’s and Master’s Degree Program.

Information: Contact the Division of Academic Affairs and Research at 512/427-6200 for more information.

---

Administrative Information

1. Institution:
The University of Texas at Austin

2. Program Name:
Bachelor of Science in Neuroscience


4. Number of Required Semester Credit Hours (SCHs): 120 semester hours

5. Administrative Unit: The College of Natural Sciences, The Section of Neurobiology within the School of Biological Sciences

6. Delivery Mode: on-campus face-to-face

7. Implementation Date: Fall 2012

8. Contact Person: Provide contact information for the person who can answer specific questions about the program.

   Name: Sacha Kopp

   Title: Associate Dean for Curriculum and Programs, College of Natural Sciences

   E-mail: kopp@hep.utexas.edu

   Phone: (512)232-0677
11. Three additional semester hours of either Biology 377 (Undergraduate Research) or 379H (Honors Tutorial Course). The research topic in Biology 377 or 379H must relate to neuroscience and be approved in advance by the faculty adviser.
12. At least eighteen semester hours of upper-division coursework in biology and neuroscience must be completed in residence at the University. All students must complete at least thirty-six semester hours of upper-division coursework.
13. Enough additional coursework to make a total of 120 semester hours.

SPECIAL REQUIREMENTS
Students must fulfill the University-wide graduation requirements given in chapter 1 and the college requirements given earlier in this chapter. They must also earn a grade of at least C- in each mathematics and science course required for the degree, and a grade point average in these courses of at least 2.00. More information about grades and the grade point average is given in General Information.
Signature Page

I hereby certify that all of the following criteria have been met in accordance with the procedures outlined in Coordinating Board Rules, Chapter 5, Subchapter C, Section 5.44:

(a) The program has institutional approval.

(b) The program complies with the Standards for Bachelor's and Master's Programs.

(c) Adequate funds are available to cover the costs of the new program.

(d) New costs during the first five years of the program will not exceed $2 million.

(e) The program is a non-engineering program (i.e., not classified under CIP code 14).

(f) The program will be offered by a university or health-related institution.

I understand that the Coordinating Board will update the program inventory for the institution if no objections to the proposed program are received during the 30-day public comment period.

__________________________
Chief Executive Officer

2/17/12

Date

I hereby certify that the Board of Regents has approved this program.

Date of Board of Regents approval: 3/12/12

__________________________
Board of Regents (or Designee)

3/12/12

Date
New Program Request Form for Bachelor’s and Master’s Degrees

Directions: An institution shall use this form to propose a new bachelor’s or master’s degree program. In completing the form, the institution should refer to the document Standards for Bachelor’s and Master’s Programs, which prescribes specific requirements for new degree programs. Note: This form requires signatures of (1) the Chief Executive Officer, certifying adequacy of funding for the new program; (2) a member of the Board of Regents (or designee), certifying Board approval, and (3) if applicable, a member of the Board of Regents or (designee), certifying that criteria have been met for staff-level approval. Note: An institution which does not have preliminary authority for the proposed program shall submit a separate request for preliminary authority. That request shall address criteria set in Coordinating Board rules Section 5.24 (a).

Information: Contact the Division of Academic Affairs and Research at 512/427-6200 for more information.

Administrative Information

1. Institution: The University of Texas at Austin

2. Program Name – Bachelor of Science in Neuroscience


4. Brief Program Description –
   The proposed Bachelor of Science degree in Neuroscience will meet the goal of a rigorous, interdisciplinary academic program to prepare students for careers in a wide range of careers in neuroscience. The program provides a strong foundation in the core sciences and related mathematical disciplines, along with a three-course specialization in one of six areas: biology, chemistry, computer science, mathematics, physics, or psychology. To remain competitive with peer institutions, the Bachelor of Science in Neuroscience will offer students in Texas a solid repertoire of neuroscience courses and practical laboratory experiences that are essential to success in top-tier graduate programs or professional work in the field. Distinctive features of the program include an emphasis on developing the quantitative, statistical, mathematical, and computational skills required in neuroscience, and meaningful hands-on laboratory experience.

5. Administrative Unit – The College of Natural Sciences, The Section of Neurobiology within the School of Biological Sciences, The University of Texas at Austin

6. Proposed Implementation Date – Fall Semester 2012

7. Contact Person –
   Name: Sacha Kopp
   Title: Associate Dean for Curriculum and Programs, College of Natural Sciences
   E-mail: kopp@hep.utexas.edu
   Phone: (512) 232-0677
Program Information

I. Need

Neuroscience, the study of the nervous system, advances our understanding of human thought, emotion, and behavior and has the potential to change the course of human life and development. Neuroscience studies the nervous system and its functioning at all levels, from neuronal communication at the cellular level to brain system functions involved in the development and use of language. From these studies, neuroscience advances our knowledge of how the nervous system develops and functions normally and discovers what goes wrong in neurological disorders\(^1\). Only in recent decades has neuroscience become a recognized discipline\(^2\). It is now a unified field that integrates biology, chemistry, mathematics, computer science, engineering, and physics with studies of structure, physiology, and behavior, including human emotional and cognitive functions.

National Profile

Interdisciplinary neuroscience programs at both the undergraduate and graduate level have become the standard at top institutions around the world. According to the Biennial Survey Report of Neuroscience Departments and Programs in 2009, there were 114 institutions offering graduate degrees in neuroscience, and 23% of these institutions offered undergraduate degrees as well. As shown in Table 1, our peer institutions are among those who have the most recognized undergraduate programs in neuroscience.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amherst College</td>
<td>B.A. Neuroscience</td>
</tr>
<tr>
<td>Columbia University</td>
<td>B.A. Neuroscience and Behavior</td>
</tr>
<tr>
<td>University of California, Los Angeles</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>University of Southern California</td>
<td>B.A. Neuroscience</td>
</tr>
<tr>
<td>Johns Hopkins University</td>
<td>B.A. Neuroscience</td>
</tr>
<tr>
<td>Northwestern University</td>
<td>B.S. Cognitive Science</td>
</tr>
<tr>
<td>Washington University</td>
<td>B.A. Neuroscience</td>
</tr>
<tr>
<td>Massachusetts Institute of Technology</td>
<td>B.S. Brain and Cognitive Sciences</td>
</tr>
<tr>
<td>Brown University</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>University of Michigan, Ann Arbor</td>
<td>B.S. Brain, Behavior &amp; Cognitive Science</td>
</tr>
<tr>
<td>Dartmouth</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>Ohio State University*</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>Duke University</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>Indiana University, Bloomington</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>University of Miami</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>Georgia State University</td>
<td>B.S. Neuroscience</td>
</tr>
<tr>
<td>Tulane University</td>
<td>B.S. Neuroscience</td>
</tr>
</tbody>
</table>

\(^1\) [http://www.sfn.org/index.aspx?pagename=whatsNeuroscience]
\(^2\) [http://www.sfn.org/index.aspx?pagename=about_SfN]

AAR1061.docxNo PDF
New Program Request Form for Bachelor's and Master's Degrees
Page 3

*Pending approval for 2012-14 catalog.

University of Texas at Austin Profile

The University of Texas at Austin is well-positioned to advance the study of neuroscience in the State of Texas. There are 24 world-class neuroscience faculty in the School of Biological Sciences, including two members of the National Academy of Sciences. These faculty collaborate with more than 50 faculty from 13 diverse departments in the Institute for Neuroscience (INS), the intellectual and administrative center for neuroscience research at the University of Texas at Austin. The INS administers the neuroscience graduate program and coordinates research efforts across all major disciplines and techniques in neuroscience including molecular, physiology, cellular and systems research, cognition, behavior, and the neurobiology of disease.

The multidisciplinary environment fostered by the INS creates a vibrant, collaborative and exciting environment that poises the INS on the cutting edge of neuroscience training and research. Because of the outstanding and diverse composition of the INS faculty, undergraduate students will be provided with unparalleled opportunities for research and will be trained to become critical thinkers capable of understanding the full breadth of conceptual and technical approaches to neuroscience.

Role of Proposed Degree

Currently, undergraduate students at UT Austin have no avenue to acquire the diverse set of skills and knowledge required for a career in neuroscience without substantially adding to their time-to-degree. The most feasible option for students interested in neuroscience is to complete a broad-based Bachelor of Science in Biology degree that incorporates a limited specialization in neurobiology. This degree, the BS Biology Option IV: Neurobiology, is intended to educate students as broadly-trained biologists and, as such, emphasizes a broad exposure to the biological sciences without the full range of physical, computational, mathematical, behavioral and psychological coursework essential to the contemporary study of neuroscience. Students interested in a career in neuroscience must supplement the 126-hour biology degree requirements substantially to be competitive applicants for neuroscience graduate programs.

The proposed Bachelor of Science degree in Neuroscience is designed to provide undergraduates with a rigorous and multidisciplinary educational opportunity. The degree provides a strong foundation in the core sciences along with a three-course specialization in one of six areas: biology, chemistry, computer science, mathematics, physics, or psychology. Distinctive features of the program include an emphasis on developing the quantitative, statistical, mathematical, and computational skills required in neuroscience and a sequence of meaningful hands-on laboratory experiences. The program of work creatively weaves together the necessary foundational work in the sciences, including a common core of innovative neuroscience courses developed by our faculty, while allowing students to focus on their particular area of specialization within a 120-hour undergraduate degree.

The proposed BS in Neuroscience is designed to augment, and not replace, the degree
programs that the college and the school already have in place. The existing BS Biology Option IV is a robust degree with approximately 320 majors, the majority of whom are completing the degree as preparation for medical school or a career in allied-health. Faculty advisors estimate that roughly 20% of these matriculated students will seek to enter the gateway sequence for the BS Neuroscience. For the remaining 80%, the BS Biology degree provides a valuable introduction to neurobiology from the biological perspective and should remain a viable option for students interested in this specialization as they prepare for medical school.

We anticipate that the proposed BS Neuroscience will also be attractive to a subset of those students who are currently pursuing a psychology major or a computational degree in biology, chemistry, physics or engineering. Students interested in the proposed BS Neuroscience will enter the neuroscience gateway sequence of courses as sophomores. This sequenced programming will allow for the lateralization that is built into the current advising structure in the School of Biological Sciences, and will also support students transitioning from other departments and colleges at the sophomore and junior level. The degree has 107-111 structured hours, including University and College requirements. This will allow migration into the degree program with no increase in residence time at the University.

A. Job Market Need

Neuroscience research is pushing the envelope on one of science’s last and most daunting frontiers — the brain. This work holds great promise for understanding and treating stroke, schizophrenia, Alzheimer’s disease and other illnesses. In today’s economic climate, there is greater financial support for research with clear clinical implications than for basic research\(^3\). Thus, there is a greater demand in the workforce for neuroscientists with training that emphasizes not only basic neurobiology but also an understanding of how neurobiology relates to human cognition and behavior\(^3\). Through their research, neuroscientists work to

- describe the human brain and how it functions normally.
- determine how the nervous system develops, matures and maintains itself.
- find ways to prevent or cure many devastating neurological and psychiatric disorders.

Market Demand

Demand for neuroscientists with interdisciplinary training is expected to continue to grow over the next several decades. Currently, indicators of this growth can be seen in the rapid development of neurotechnology, the research interests of private-sector companies, and the rise of neuroscience research institutes:

- The 2011 *NeuroInsights Investment Guide* reported that brain-related illness is the largest unmet medical market and that neurotechnology company revenues from

neurodevices, neuropharmaceuticals, and neurodiagnostics increased at rates of 13% during 2010. These revenue-producing technologies cover a broad range of areas within the discipline of neuroscience, including clinical neuroscience and neural engineering.

- In the private sector, companies like IBM and Hewlett-Packard are investing heavily in efforts to develop computer chips modeled after the circuitry of the brain. Neural engineering is also a rapidly growing field. Both private companies and public agencies are investing a tremendous amount of resources toward the development of neural prosthetics and brain-machine interfaces designed to help treat patients with brain damage or neurological disorders. Even game design companies have begun to utilize neuroscience to create devices that translate brain activity into commands that control game players' virtual actions.

- Institutes devoted to neuroscience research are being established at a relatively high rate, thereby creating jobs for graduates with exceptional laboratory research experience. Two examples include The Allen Institute for Brain Science and the Redwood Neuroscience Institute, both founded within the last decade. These and other similar neuroscience research institutions require a workforce of highly skilled neuroscientists, particularly those with rigorous interdisciplinary training.

**Job Titles**

Completion of a graduate degree in neuroscience leads to virtually 100% employment in a research, government or faculty position with a median annual wage of $56,540-$106,410. The highest salaries were paid by companies engaged in research and development. A selection of the positions available to those with an advanced degree in neuroscience include:

*Neuroanatomists*, who study the structure and organization of the nervous system. With special dyes, they detect specific neurotransmitters, and mark neurons and synapses with specific characteristics and functions.

*Developmental neuroscientists*, who study how the brain grows and changes. They define chemicals and processes neurons use to seek out and connect with other neurons and maintain connections.

*Cognitive neuroscientists*, who study functions such as perception and memory in animals by using behavioral methods and other neuroscience techniques. In humans, they use non-invasive brain scans -- such as positron emission tomography

---


and magnetic resonance imaging -- to uncover routes of neural processing that occur during language, problem solving and other tasks.

**Behavioral neuroscientists**, who study the processes underlying behavior in humans and in animals. Their tools include microelectrodes, which measure electrical activity of neurons, and brain scans, which show parts of the brain that are active during activities such as seeing, speaking or remembering.

**Clinical neuroscientists** — psychiatrists, neurologists and other medical specialists who use basic research findings to develop diagnostic methods and ways to prevent and treat neurological disorders that affect millions of people.

**Entry-Level Positions**

Entry-level bachelor's positions in neuroscience include positions within government, industry and academia as research assistants, laboratory technicians, consultants, marketing/sales representatives, educators and public health workers. Examples of recently posted positions requiring a bachelor's degree include:

- **Neuroscience Specialty Sales Representative**, with a focus on hospital clientele
- **Neuroscience Pharmaceutical Primary Care Sales Representative**
- **Consultant**, for a neuroscience data sciences group
- **Research Associate**, in a neuroscience laboratory
- **Operations Manager**, for a neuroscience laboratory
- **Neuroscience Program Coordinator**, conducting outcomes measures
- **Biological Technician**, neuroscience laboratory

Employment demand for biotechnicians alone is projected to grow by 22-25%, from 79,500 positions in 2008 to 93,500 positions in 2018. The forecast for bio-technology positions in the Texas labor market is similar, with a projected increase of 23% from 2008 to 2018 and a mean annual wage of $35,360-$45,000. A national job search query on Monster.com produced 1,000+ hits for positions in biotechnology alone, the vast majority of which were entry-level. An additional 800+ positions were available in health-related research and development areas.

**Preparing Students for the Workforce**

Emerging jobs in the field of neuroscience require a workforce with strong interdisciplinary training⁹, and the best undergraduate programs in the nation are designed to be multidisciplinary. In a recent career advice article in *Science*, the former president of the Society for Neuroscience, David Van Essen, specifically advises that students seek broad training, "not just in one narrow area of neuroscience, but trying to

---

⁹ SOCRATES, [http://socrates.cdrl.state.tx.us/](http://socrates.cdrl.state.tx.us/)

obtain a background that uses multiple approaches and can attack problems from a relatively broad perspective."

The proposed BS Neuroscience degree will promote students’ understanding of the brain in a deep and integrated way to prepare them to become productive members of the workforce, both at the post-baccalaureate and post-graduate level. Graduates of the BS Neuroscience degree will have the necessary quantitative reasoning and computational skills required to successfully contribute to the development of new and emerging technologies, lead the development of new diagnostic measures to identify and treat disease, participate in innovative research laboratory environments, and understand the foundational science that underlies all of the current advancements in neuroscience. The foundational skills and knowledge will make graduates highly employable in industry or government positions and will ensure that graduates are highly competitive for admission to top-tier graduate programs in neuroscience, including MD/PhD programs, should they choose this path.

B. Student Demand

Student interest in the field of neuroscience is growing rapidly, as evidenced by the consistently high enrollment patterns of students in the existing neurobiology option, the rapidly filling neuroscience laboratories offered each semester, and the participation of undergraduates in the neuroscience student network Synapse. Synapse began as an initiative of the Institute of Neuroscience to create a forum for undergraduates interested in neuroscience to socialize and participate in undergraduate research at the Institute. This student-led organization has now grown to include:

* sponsored lab tours
* invited speakers from UTHSCSA, UTSW, and others
* bi-weekly undergraduate research information sessions
* community service opportunities
* doctor shadowing associated with mental health or neuroscience
* poster presentation/research report practice for students
* attending various annual neuroscience symposiums and seminars at UT.
* social events (movie screenings at meetings as well as off campus activities)
* a Neurolympiad competition each March

Student interest in rigorous, interdisciplinary, career-focused degrees is further evidenced by the tremendous response of students to two new degree plans added to the College in 2010, the BS Public Health and the BS Environmental Science degrees. Both degrees have attracted more than 300 highly talented students to the majors in the last two years. Similar to proposed BS Neuroscience degree, students who pursue a degree in public health or environmental science can choose to enter the workforce directly or, as a consequence of their highly integrated coursework, elect to pursue graduate school at top-tier institutions across the country. We expect that the proposed neuroscience degree will be similarly successful in attracting students interested in advanced study as well as those who seek entry-level positions.
New Program Request Form for 
Bachelor's and Master's Degrees 
Page 8 

C. Enrollment Projections 

By year 5, we anticipate a full cohort of 150 students in the BS Neuroscience major. We expect that sixty-percent of the students will have been attracted to the institution because of the major, and forty-percent will be drawn from students who would have previously selected a neurobiology, psychology or computational-related major at UT Austin.

Total Enrollment Projections for the BS Neuroscience Degree:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount</td>
<td>25</td>
<td>60</td>
<td>90</td>
<td>125</td>
<td>150</td>
</tr>
<tr>
<td>FTSE</td>
<td>25</td>
<td>60</td>
<td>90</td>
<td>125</td>
<td>150</td>
</tr>
</tbody>
</table>

Enrollment Projections for BS Neuroscience Students New to UT Austin:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount</td>
<td>10</td>
<td>25</td>
<td>40</td>
<td>65</td>
<td>90</td>
</tr>
<tr>
<td>FTSE</td>
<td>10</td>
<td>25</td>
<td>40</td>
<td>65</td>
<td>90</td>
</tr>
</tbody>
</table>

Used for calculating new formula funding

II. Quality

A. Degree Requirements

<table>
<thead>
<tr>
<th>Category</th>
<th>Semester Credit Hours</th>
<th>Clock Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education Core Curriculum (bachelor's degree only)</td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>Required Courses (those not counted toward UT Core)</td>
<td></td>
<td>38-42</td>
</tr>
<tr>
<td>Prescribed Electives</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Free Electives (Free elective hours will vary depending on which courses students elect to complete their degree requirements. Total semester hours for the degree must)</td>
<td></td>
<td>9-13</td>
</tr>
</tbody>
</table>
B. Curriculum—Courses that will be added if the program is approved are noted with an asterisk (*).

<table>
<thead>
<tr>
<th>Prefix and Number</th>
<th>Required Courses</th>
<th>SCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 311C</td>
<td>Introductory Biology I (may take BIO 315H: Advanced Introduction to Genetics: Honors as alternative)</td>
<td>3</td>
</tr>
<tr>
<td>BIO 311D</td>
<td>Introductory Biology II (may take BIO 315H: Advanced Introduction to Genetics: Honors as alternative)</td>
<td>3</td>
</tr>
<tr>
<td>BIO 206L</td>
<td>Laboratory Experiments in Biology: Structure and Function of Organisms</td>
<td>2</td>
</tr>
<tr>
<td>CH 301</td>
<td>Principles of Chemistry I (may take CH 301H: Principles of Chemistry I: Honors as alternative)</td>
<td>3</td>
</tr>
<tr>
<td>CH 302</td>
<td>Principles of Chemistry II (may take CH 302H: Principles of Chemistry II: Honors as alternative)</td>
<td>3</td>
</tr>
<tr>
<td>CH 204</td>
<td>Introduction to Chemical Practice</td>
<td>2</td>
</tr>
<tr>
<td>M 408C</td>
<td>Differential and Integral Calculus (may take M 408N: Differential Calculus for Science &amp; M 408S: Integral Calculus for Science as an alternative)</td>
<td>4</td>
</tr>
<tr>
<td>M 408D</td>
<td>Sequences, Series, and Multivariable Calculus (may take M 408M: Multivariable Calculus)</td>
<td>4</td>
</tr>
<tr>
<td>M 362K</td>
<td>Probability I (may take SSC 321: Introduction to Probability and Statistics)</td>
<td>3</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Description</td>
<td>Credits</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>PHY 301 and 101L</td>
<td>Mechanics and Laboratory for Physics 301 (may take another calculus-based physics course and lab as an alternative)</td>
<td>4</td>
</tr>
<tr>
<td>PHY 316 and 116L</td>
<td>Electricity and Magnetism and Laboratory for Physics 316 (may take another calculus-based physics course and lab as an alternative)</td>
<td>4</td>
</tr>
<tr>
<td>*NEU 330</td>
<td>Neural Systems I (may take BIO 365R: Vertebrate Neurobiology as an alternative)</td>
<td>3</td>
</tr>
<tr>
<td>*NEU 335</td>
<td>Neural Systems II</td>
<td>3</td>
</tr>
<tr>
<td>*NEU 366M</td>
<td>Mathematical and Computational Neuroscience I (may take *BIO 366M: Mathematical and Computational Neuroscience I as an alternative)</td>
<td>3</td>
</tr>
<tr>
<td>*NEU 366N</td>
<td>Mathematical and Computational Neuroscience II (may take *BIO 366N: Mathematical and Computational Neuroscience II as an alternative)</td>
<td>3</td>
</tr>
<tr>
<td>BIO 377</td>
<td>Undergraduate Research (may take BIO 379H: Honors Tutorial Course as an alternative)</td>
<td>3</td>
</tr>
</tbody>
</table>

*Course will appear in the course inventory beginning Fall 2012.

**Additional Major Requirements:**


2. Twelve semester hours in laboratory courses chosen from the following: BIO 365L Neurobiology Laboratory, BIO 366L Neuroimaging Laboratory, BIO 366P
Laboratory in Psychophysics, BIO 366S Laboratory in Neuromolecular and Developmental Biology, and BIO 377 Undergraduate Research.

3. Three additional courses selected from one of the following supporting disciplines:

(a) Biology

BIO 320 Cell Biology, BIO 325 Genetics (may take BIO 325H Genetics: Honors as an alternative), BIO 344 Molecular Biology, BIO 349 Developmental Biology.

(b) Chemistry

CH 328M Organic Chemistry I and CH 128K Organic Chemistry Laboratory, CH 328N Organic Chemistry II and CH 128L Organic Chemistry Laboratory, CH 339K Biochemistry I (may take CH 369 Fundamentals of Biochemistry as an alternative), and CH 353 Physical Chemistry I (may take CH 353M Physical Chemistry I for Life Sciences as an alternative).

(c) Computer Science

CS 312 Introduction to Programming, 314 Data Structures, SSC 335 Scientific and Technical Computing, and SSC 374E Visual and Data Analysis.

(d) Mathematics

M 427K Advanced Calculus for Applications I, M 340L Matrices and Matrix Calculations (may take M 341 Linear Algebra and Matrix Theory or SSC 329C Practical Linear Algebra I as an alternative), and M 358K Applied Statistics (may take M 378K Introduction to Mathematical Statistics as an alternative).

(e) Physics

*PHY 335 Biophysics, PHY 338K Electronic Techniques, and PHY 355 Modern Physics and Thermodynamics.

(f) Psychology

PSY 301 Introduction to Psychology, PSY 323 Perception, and PSY 353K Psychopharmacology (may take PSY 355 Cognition as an alternative).

*The courses will appear in the Course Inventory beginning Fall 2012.

4. Additional Prescribed Coursework:

Students must complete two courses with a substantial writing component or a writing flag. One of these courses must be upper-division.
C. **Faculty** — The name of the individual who will have direct administrative responsibility for the program is indicated with a double asterisk (**).  

<table>
<thead>
<tr>
<th>Name of Core Faculty and Faculty Rank</th>
<th>Highest Degree and Awarding Institution</th>
<th>Courses Assigned in Program</th>
<th>% Time Assigned to Program (by Year 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aldrich, Richard, Professor</strong></td>
<td>Ph.D in Neuroscience, Stanford University</td>
<td>BIO 366C</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Johnston, Daniel, Professor</strong></td>
<td>Ph.D in Biomedical Engineering, Duke University</td>
<td>BIO 366D</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Mauk, Michael, Professor</strong></td>
<td>Ph.D in Psychology, Stanford University</td>
<td>NEU 330, NEU 335</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Golding, Nace, Assoc. Professor</strong></td>
<td>Ph.D in Neuropsychology, University of Wisconsin</td>
<td>BIO 365L</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Huk, Alex, Assoc. Professor</strong></td>
<td>Ph.D in Psychology, Stanford University</td>
<td>BIO 366S</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Nishiyama, Hiroshi, Asst. Professor</strong></td>
<td>Ph.D in Chemistry, Kyoto University, Japan</td>
<td>BIO 366L</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Drew, Michael, Asst. Professor</strong></td>
<td>Ph.D in Psychology, Columbia University</td>
<td>NEU 330, NEU 335</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Fiete, Ila, Asst. Professor</strong></td>
<td>Ph.D in Physics, Harvard University</td>
<td>NEU 366M, NEU 366N</td>
<td>33%</td>
</tr>
</tbody>
</table>

Faculty members in the College of Natural Sciences and the College of Liberal Arts currently teach the requisite courses for a Neuroscience degree. At this point, no additional faculty would need to be hired to teach major-level courses or to cover courses for existing faculty, as there is capacity in the current courses offered to accommodate new majors.

D. **Students**

All new freshman and transfer students are admitted into the College of Natural Sciences in an entry-level major. The Bachelor of Science in Neuroscience will be listed among the College’s entry-level majors beginning Fall 2012, pending final approval of the new degree program. To be formally admitted to the major, students must complete a specified set of entry-level courses with grades of C- or better. For the Bachelor of Science in Neuroscience major, these entry-level courses will include BIO 311C and BIO 311D, CH 301 and CH 302, and M 408C (or M 408N). Once students have successfully completed their entry-level courses, the students are promoted into the major by the college advising center in the School of Biological Sciences. Current students will have an opportunity to be admitted to the major by completing the same entry-level courses as freshmen and transfer students.

The major will be advertised by the College of Natural Sciences Career Services and AAR/1061.docxNo PDF.
Health Professions Offices and by academic advisors in the School of Biological Sciences and in the Transitional Advising Center. Additional efforts will be made to educate academic advisors and students about the new degree plan in the School of Undergraduate Studies, the College of Liberal Arts, and the Plan II and Dean's Scholars Honors programs.

The BS Neuroscience degree expects to serve a diverse pool of students. The University of Texas at Austin and the College of Natural Sciences are committed to the recruitment and retention of students, including those from underrepresented groups. Advising structures for incoming freshmen, along with existing interdisciplinary programs such as the Texas Interdisciplinary Plan, the Freshmen Research Initiative, and the Biology Scholars program, reach out to underrepresented students early in their careers and assist them with finding degree plans of interest. It is expected that this degree will be particularly attractive to those students who have a passion for the scientific study of the nervous system and who desire a diverse set of skills to equip themselves as neuroscientists.

E. Library – Existing library resources are excellent. We do not expect to develop substantial new library resources within the next five years.

The University Library System houses a collection of more than 9,990,941 volumes. All units of the University of Texas Libraries offer reference service, circulation and reserve services, access to computer -based information services, interlibrary loan, study spaces and photocopy service. The University of Texas Libraries has extensive electronic information resources and services that are deliver to students, faculty and staff through the University of Texas Libraries website, www.lib.utexas.edu, and has extensive links to other libraries and information resources.

Neuroscience materials are collected primarily at the Life Science and Perry-Castañeda (PCL) Libraries at the research support level. Primary holdings are complemented by relevant collections at the Engineering, Physics-Math-Astronomy and Chemistry Libraries. Combined holdings for books in neuroscience specifically are over 25,000 volumes. Journals are received primarily as online subscriptions accessible through the Libraries website. Journal backfiles in print, generally pre-1998, are also maintained. Relevant journal subscriptions in biology, psychology and medicine number in the thousands. Indicative of the depth of journal coverage for neuroscience is this representative sample taken from the top ranked (ISI Journal Citation Report) neuroscience titles.

Acta neuropathologica
Annals of neurology
Annual Review of Neuroscience
ASN neuro
Behavioral and brain sciences
Biological psychiatry

Bipolar disorders
Brain
Brain pathology
Brain research reviews
Brain stimulation
Brain structure & function
Brain, behavior, and immunity  
Cerebral cortex  
Cortex  
Current Opinion in Neurobiology  
Current opinion in neurology  
European journal of neurology  
European journal of pain  
European neuropsychopharmacology  
Experimental neurology  
Frontiers in neuroendocrinology  
Genes, brain and behavior  
GLIA  
Hippocampus  
Human brain mapping  
International journal of neuropsychopharmacology  
Journal of cerebral blood flow and metabolism  
Journal of cognitive neuroscience  
Journal of comparative neurology  
Journal of neurochemistry  
Journal of neuroendocrinology  
Journal of neuroinflammation  
Journal of neuropathology and experimental neurology  
Journal of neuroscience  
Journal of pain  
Journal of physiology  
Journal of pineal research  
Journal of Psychiatry & Neuroscience  
Learning & memory  
Molecular and cellular neurosciences  
Molecular neurobiology  
Molecular neurodegeneration  
Molecular pain  
Nature reviews. Neuroscience  
Neurobiology of Aging  
Neurobiology of disease  
Neurobiology of learning and memory  
NeuroImage  
Neuromolecular medicine  
Neuron  
Neuropharmacology  
Neuropsychologia  
Neuropsychology review  
Neuropsychopharmacology  
Neuroscience & biobehavioral reviews  
Neuroscientist  
Neurotherapeutics  
Pain  
Progress in Neurobiology  
Psychoneuroendocrinology  
Psychopharmacology  
Sleep  
Sleep medicine reviews  
Social cognitive and affective neuroscience  
Trends in cognitive sciences  
Trends in neurosciences

F. Facilities and Equipment –

Internal and external resources and facilities are available to support the proposed Bachelor of Science in Neuroscience degree program. These include extensive laboratory facilities and UT Austin campus centers dedicated to neuroscience research. The School of Biological Sciences has numerous laboratory facilities which are used for research and teaching.

Centers and Institutes:

The Institute for Neuroscience (INS) is the intellectual and administrative center for neuroscience research at the University of Texas at Austin. The INS administers the neuroscience graduate program and is home to more than 70 diverse neuroscience related faculty that represent all major disciplines and techniques in neuroscience including molecular, physiology, cellular and systems research, cognition, behavior,
and the neurobiology of disease. The multidisciplinary environment fostered by the INS creates a vibrant, collaborative and exciting environment that poises the INS on the cutting edge of neuroscience training and research.

**The Center for Perceptual Systems** is an integrated program that overlaps several separate departments: Neuroscience, Psychology, Electrical and Computer Engineering, Neurobiology, Computer Science, and Speech and Communication.

**The Waggoner Center for Alcohol and Addiction Research** was created to research these neurological disorders. Established in 1999 as an organized research unit of The University of Texas at Austin, the Center was made possible by a donation from M. June and J. Virgil Waggoner and matching university funds.

Investigators from the Colleges of Natural Sciences, Liberal Arts and Pharmacy explore alcohol and drug actions at the molecular, electrophysiological and behavioral levels. Interdisciplinary collaborations allow the development of new tools and research approaches not possible in any one laboratory.

The Center is strongly committed to training future scientists. In addition to developing undergraduate and graduate courses in addiction biology, UT Austin has designated endowment funds to support graduate students in this research field.

**The Institute for Cellular and Molecular Biology (ICMB)** is a university-wide, interdisciplinary research unit, whose goal is to promote cell and molecular biology research and education at the University of Texas at Austin. Established as an administrative unit in 1993, full funding for ICMB began in September 1997 with the opening of the Louise and James Robert Moffett Molecular Biology Building (MBB). ICMB currently has more than 120 faculty members affiliated with 17 separate departments in the Colleges of Natural Sciences, Engineering, and Pharmacy. ICMB faculty are broadly interdisciplinary with research areas including biochemistry, cell and developmental biology, molecular biology, molecular evolution, molecular genetics, microbiology, nanoscience, systems biology, neurobiology, chemical biology, drug development, structural biology, biophysics, biodefense, nutrition, pharmaceutical sciences, bioengineering, bioinformatics, and computational biology. The faculty is highly interactive and engages in numerous interdisciplinary collaborations, a major strength compared to other cell and molecular biology programs. A strong component of research in ICMB is medically oriented, similar to medical school basic science departments. This medical orientation has been enhanced by a new MD-PhD program with University Texas Medical Branch and by interfaces with the new Dell Pediatrics Research Institute, which will provide additional opportunities for translational medical research.

**The Center for Learning and Memory** was created at The University of Texas by the Provost in 2004. It is a freestanding research unit within the College of Natural Sciences, reporting to the Dean. The essence of who we are and how we experience life depends on maintaining a healthy, active brain. Accordingly, both the public and scientific communities have had a long-standing interest in fostering brain research. The Center for Learning and Memory (CLM) at The University of
Texas at Austin is a research center of excellence that marshals the collective abilities of world-class neuroscientists from diverse disciplines with the common goal of revealing the basic mechanisms underlying human learning and memory and diseases of cognition.

The Imaging Research Center at the University of Texas, Austin is dedicated to serve as a center of excellence in imaging science and technology through intensive interactions with academic, industry, government, and other laboratories in the US and abroad.

The research problems addressed at the IRC are for the public good and include cognitive brain functions as associated with training and performance, investigation of the underlying factors associated with Post Traumatic Stress Disorder, understanding brain functions as they relate to addiction, and multiple other biological processes which are appropriate for study using MRI. Researchers are also developing new fMRI and MRI techniques and procedures. This research is accomplished in a new building constructed specifically for this purpose using a high field (3 Tesla) MRI instrument, an image analysis computer suite, laboratory and test rooms, offices, and a conference/classroom area.

Facilities:

The Protein Microanalysis Facility provides peptide synthesis services utilizing a PTI Symphony synthesizer. N-terminal protein/peptide sequencing (ABI Procise 492 cLC) is performed in-house and internal sequencing / peptide mapping is available in conjunction with the Pharmacy Analytical Instrumentation Facility. In-gel digestion of proteins from gel or PVDF pieces can be performed in the Facility for submission to the AIF or other facility for protein ID via MALDI-TOF-TOF or LC-MS. The Facility possesses several LC and HPLC systems that are available to trained users for both analytical and preparative purposes. (Beckman System Gold; GE Biosciences AKTA, two Bio-rad Duoflow systems). A MALDI-TOF mass spectrometer (Perseptive Biosystems Voyager) is also available for use after training. The Facility also offers electrophoresis and electroblotting services. A Mithras LB 940 multi-label reader and Phenix protein crystallization robot are also housed in the Facility.

The Mouse Genetic Engineering Facility, located in Room 1.218 of the ARC Building provides many services to the UT research community. Our primary focus is the generation of transgenic and gene-targeted mice, however we offer numerous other related services such as mouse housing and husbandry within a specific pathogen free barrier.

The ICMB Microscopy and Imaging Facility provides extensive microscopic equipment and services for ultra-structural analysis. The Facility offers assisted use and training on all instrumentation and consultations on microscopy and spectroscopy related subjects.
The Animal Research Center oversees the care and use of vertebrate animals utilized as part of the research and teaching activities of the University and serves as a source of expertise and support for investigators and the administration on all issues related to laboratory animals.

The Center for Computational Biology and Bioinformatics (CCBB) provides research support and opportunities for students, postdoctoral fellows, and faculty interested in the use of computational approaches in solving biological problems. http://www.biosci.utexas.edu/Neuro/resources/

G. Accreditation

There is no accreditation body for neuroscience degree programs.

III. Costs and Funding

<table>
<thead>
<tr>
<th>Five-Year Costs</th>
<th>Five-Year Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>Reallocated Funds</td>
</tr>
<tr>
<td>$ 801,276</td>
<td>$ 22,660</td>
</tr>
<tr>
<td>Facilities and Equipment</td>
<td>Anticipated New Formula Funding</td>
</tr>
<tr>
<td>--</td>
<td>$ 864,416</td>
</tr>
<tr>
<td>Library, Supplies, and Materials</td>
<td>Special Item Funding</td>
</tr>
<tr>
<td>$ 85,800</td>
<td>--</td>
</tr>
<tr>
<td>Other</td>
<td>--</td>
</tr>
<tr>
<td>Total Costs</td>
<td>Total Funding</td>
</tr>
<tr>
<td>$ 887,076</td>
<td>$ 887,076</td>
</tr>
</tbody>
</table>

NOTE: See attached spreadsheet with faculty and supply cost details.

Signature Page

1. Adequacy of Funding – The chief executive officer shall sign the following statement:

   I certify that the institution has adequate funds to cover the costs of the new program. Furthermore, the new program will not reduce the effectiveness or quality of existing programs at the institution.

   [Signature]
   [Name]
   [Title]
   [Date]

2. Board of Regents or Designee Approval – A member of the Board of Regents or designee shall sign the following statement:
On behalf of the Board of Regents, I approve the program.

Board of Regents (Designee)  Date of Approval

3. Board of Regents Certification of Criteria for Commissioner of Assistant Commissioner Approval – For a program to be approved by the Commissioner or the Assistant Commissioner for Academic Affairs and Research, the Board of Regents or designee must certify that the new program meets the eight criteria under TAC Section 5.50 (b): The criteria stipulate that the program shall:

(1) be within the institution’s current Table of Programs;
(2) have a curriculum, faculty, resources, support services, and other components of a degree program that are comparable to those of high quality programs in the same or similar disciplines at other institutions;
(3) have sufficient clinical or in-service sites, if applicable, to support the program;
(4) be consistent with the standards of the Commission of Colleges of the Southern Association of Colleges and Schools and, if applicable, with the standards or discipline-specific accrediting agencies and licensing agencies;
(5) attract students on a long-term basis and produce graduates who would have opportunities for employment; or the program is appropriate for the development of a well-rounded array of basic baccalaureate degree programs at the institution;
(6) not unnecessarily duplicate existing programs at other institutions;
(7) not be dependent on future Special Item funding
(8) have new five-year costs that would not exceed $2 million.

On behalf of the Board of Regents, I certify that the new program meets the criteria specified under TAC Section 5.50 (b).

Board of Regents (Designee)  Date
**Formula Funding -BS Neuroscience, UT Austin**

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated Number of Students</th>
<th>Estimated Hours per Year</th>
<th>Upper Division Weight Factor</th>
<th>09-10 Matrix Funding</th>
<th>Formula Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 3</td>
<td>40</td>
<td>24</td>
<td>2.97</td>
<td>62.19</td>
<td>177,316</td>
</tr>
<tr>
<td>Year 4</td>
<td>65</td>
<td>24</td>
<td>2.97</td>
<td>62.19</td>
<td>288,139</td>
</tr>
<tr>
<td>Year 5</td>
<td>90</td>
<td>24</td>
<td>2.97</td>
<td>62.19</td>
<td>398,961</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>864,416</strong></td>
</tr>
</tbody>
</table>
## Projected 5-Year Costs for Proposed BS Neuroscience, UT Austin

<table>
<thead>
<tr>
<th>Core Faculty</th>
<th>Rank</th>
<th>Salary</th>
<th>% time</th>
<th>Salary</th>
<th>% time</th>
<th>Salary</th>
<th>% time</th>
<th>Salary</th>
<th>% time</th>
<th>Total 5-yr Cost</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldrich, Richard (BIO)</td>
<td>Professor</td>
<td>137,449</td>
<td>0.25</td>
<td>141,572</td>
<td>0.25</td>
<td>145,820</td>
<td>0.25</td>
<td>150,194</td>
<td>0.25</td>
<td>154,700</td>
<td>0.25</td>
</tr>
<tr>
<td>Johnston, Daniel</td>
<td>Professor</td>
<td>137,449</td>
<td>0.1</td>
<td>141,572</td>
<td>0.1</td>
<td>145,820</td>
<td>0.1</td>
<td>150,194</td>
<td>0.1</td>
<td>154,700</td>
<td>0.1</td>
</tr>
<tr>
<td>Mok, Michael (BIO)</td>
<td>Professor</td>
<td>137,449</td>
<td>0.36</td>
<td>141,572</td>
<td>0.36</td>
<td>145,820</td>
<td>0.36</td>
<td>150,194</td>
<td>0.16</td>
<td>154,700</td>
<td>0.16</td>
</tr>
<tr>
<td>Golding, Nase</td>
<td>Associate Professor</td>
<td>82,278</td>
<td>0.1</td>
<td>89,893</td>
<td>0.1</td>
<td>92,583</td>
<td>0.1</td>
<td>95,166</td>
<td>0.16</td>
<td>98,227</td>
<td>0.16</td>
</tr>
<tr>
<td>Huh, Alex</td>
<td>Associate Professor</td>
<td>82,278</td>
<td>0.1</td>
<td>89,893</td>
<td>0.1</td>
<td>92,583</td>
<td>0.1</td>
<td>95,166</td>
<td>0.16</td>
<td>98,227</td>
<td>0.16</td>
</tr>
<tr>
<td>Nishiyama, Hiroshi</td>
<td>Assistant Professor</td>
<td>76,146</td>
<td>0.1</td>
<td>77,405</td>
<td>0.1</td>
<td>79,722</td>
<td>0.1</td>
<td>82,134</td>
<td>0.16</td>
<td>84,577</td>
<td>0.16</td>
</tr>
<tr>
<td>Drew, Michael</td>
<td>Assistant Professor</td>
<td>76,146</td>
<td>0.33</td>
<td>77,405</td>
<td>0.33</td>
<td>79,722</td>
<td>0.33</td>
<td>82,134</td>
<td>0.33</td>
<td>84,577</td>
<td>0.33</td>
</tr>
<tr>
<td>Fiele, Xu</td>
<td>Assistant Professor</td>
<td>76,146</td>
<td>0.38</td>
<td>77,405</td>
<td>0.38</td>
<td>79,722</td>
<td>0.38</td>
<td>82,134</td>
<td>0.38</td>
<td>84,577</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Notes:
1. Salaries are average salary rates for departmental faculty in 2009-10.
2. Percentage time calculations are based off of teaching-load expectations (1-1) and consider (assistant) schedules.
3. A research assistant position is assumed each year. In the absence of this salary increase, the overall cost of the program would decrease accordingly.

### Supplies

<table>
<thead>
<tr>
<th>Supplies</th>
<th>Average Cost per Lab</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Total</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Costs Added for New Majors</td>
<td>$6,600</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>13</td>
<td>$5800</td>
</tr>
</tbody>
</table>