

**Board of Governors Staff Analysis:  
Ph.D. in Neuroscience  
Florida Atlantic University  
REVISED 10/14/2021**

<b>Program</b>	Ph.D. in Neuroscience
<b>CIP Code</b>	26.1501
<b>Institution</b>	University of Florida
<b>Proposed Implementation Date</b>	Spring 2022
<b>Staff Reviewer</b>	Brittanian Gamble
<b>Initial Review Date</b>	06/15/2021

**Projected FTE and Headcount**

	Student Headcount	Student FTE
<b>Year 1</b>	8	8
<b>Year 2</b>	16	16
<b>Year 3</b>	26	26
<b>Year 4</b>	36	36
<b>Year 5</b>	48	48

**Projected program costs**

Total		Percentage & Dollar Amount					Auxiliary Funds	Cost per FTE	SUS 19-20 Average Cost per FTE
		Current Reallocated	New Recurring	New Non-Recurring	Contracts & Grants	Philanthropy & Endowment			
<b>Year 1</b>	\$466,684	100%	0%	0%	0%	0%	\$0	\$58,336	\$17,751 26 CIP
		\$466,684	\$0	\$0	\$0	\$0			
<b>Year 5</b>	\$2,103,600	81%	0%	0%	19%	0%	\$0	\$35,691	
		\$1,713,150	\$0	\$0	\$390,450	\$0			

**Proposal Page Numbers**

INTRODUCTION		ACCOUNTABILITY		READINESS				
Program Description	BOG Goals	Overall	Budget	Mission & Strength	Program Quality	Curriculum	Faculty	Resources
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## **A. Program Description**

Florida Atlantic University (FAU) is proposing a new Ph.D. in Neuroscience, CIP 26.1501. The proposed degree program is a joint effort between the Biological Sciences and Psychology departments and will be administered through the College of Science. The proposed program builds upon three existing FAU doctoral programs that include some instruction in neuroscience: complex systems and brain science, experimental psychology, and integrative biology. The new program would be a five-year program that will introduce students to a broader range of concepts in neuroscience before students choose a specialty. The expanded curriculum and research options include clinical neuroscience, brain/machine interfaces, and neurogenetics. Graduates of the program will be prepared for career opportunities in allied STEM careers such as medical technologists, research scientists, and clinical psychologists, and academia. The institution intends to charge \$371.82 per credit hour for resident students and \$1,026.81 per credit hour for non-resident students.

Students admitted to the program will be required to earn 72 credit hours beyond a baccalaureate degree and successfully defend a dissertation. The specific credit hour requirements include 30 credit hours of specialized coursework, 18 credit hours of approved advanced research or advanced elective course credits, three research rotations, and 24 dissertation credit hours. Students must also publish at least one peer-reviewed research paper as the first author. If approved by the Board of Governors, FAU will implement the program in fall 2022.

## **B. Alignment with Institutional and System Strategic Priorities**

### **Strategic Plan Alignment**

The proposed Ph.D. in Neuroscience aligns with both FAU's Strategic Plan and Mission. The goals of the proposed program directly relate to the institutional mission of pursuing excellence in research, scholarship, creative activity, teaching, and active engagement with its communities. Four pillars support FAU's mission: healthy aging, neuroscience, ocean science and engineering/environmental sciences, and sensing and smart systems. The proposed program directly supports the neuroscience pillar by stimulating advanced neuroscience research, promoting superior neuroscience education, facilitating the translation of research discoveries for the benefit of society, and enhancing the public understanding of the many dimensions of brain research and its benefits.

The proposed Ph.D. in Neuroscience also aligns with the Board of Governors 2025 Strategic Plan, including increasing degree production in STEM, strengthening the quality and reputation of academic programs in the State University System (SUS), and increasing research activity and community engagement. Since the program qualifies as a Program of Strategic Emphasis in STEM, implementation of the program will increase graduate degree production in this area, which is a performance based funding metric. The interdisciplinary design of the program connects neuroscience researchers from various disciplines such as Scripps Florida, and Max Plank Florida, which strengthens the quality of the neuroscience program and makes students and faculty more competitive for external grant funding. This directly aligns with the Board's strategic priorities of research excellence, productivity, and building a knowledge economy.

### **Need for Graduates in the Labor Market**

To demonstrate the need for doctoral graduates in the field of neuroscience, FAU provided data from the U.S. Bureau of Labor Statistics, the Florida Department of Economic Opportunity, Burning Glass, Hanover, and the National Science Foundation's National Science Board. FAU

also provided seventeen letters from academic and industry partners expressing support for the program and interest in hiring program graduates. These partners included Nikon, Max Planck Florida, BioFlorida, Expansion Therapeutics, Hesperos, Scripps Research, Palm Beach State College, and Nova Southeastern University Florida College of Pharmacy. Each letter discussed the critical need for experienced researchers in neuroscience and how the proposed program would provide the training and experience necessary for success in the field.

Board staff independently verified national and state workforce demand for neuroscience doctorates. Table 1 provides an overview of national and state job growth for occupations in neuroscience (CIP 26.1501), neurobiology and behavior (CIP 26.1504), and behavioral neuroscience (CIP 42.2706). Nationally, the Bureau of Labor Statistics projects a faster than average growth rate for related jobs requiring a doctoral degree. For example, national job openings for medical scientists are expected to grow by 16.8% over the next ten years, and postsecondary biology teacher openings are expected to grow by 12.8% in the same time frame. In Florida, the Department of Economic Opportunity also projects faster than average eight-year job growth rates for medical scientists (12.4%) and postsecondary biology teachers (17.6%). Board staff conducted an independent search of the Bureau of Labor Statistics projections on related occupations to the proposed program requiring a doctoral or professional degree. The projected ten-year change in employment for occupations such as psychologists, postsecondary teachers, and postsecondary health specialties teachers, are reported as much faster than the average rate. Specifically, the growth rate for psychologists is 10.4%, postsecondary teachers is 5.9%, and postsecondary health specialties teachers is 24.3%,

Board staff conducted a search on Indeed.com of positions requiring or listing a Ph.D. as a preferred qualification. As of August 27, 2021, there were 405 job postings in Florida directly related to the proposed program.<sup>1</sup> These postings included public and private sectors as well as higher education. For example, The Roskamp Institute, Inc. in Sarasota, Florida, advertised for a Scientist I position in neurobiology to conduct drug discovery research for neurological illnesses and listed a doctorate as a preferred qualification. An additional search was conducted on HigherEdJobs.com. As of August 27, 2021, there were 986 academic jobs posted nationwide, with seven positions available in Florida.<sup>2</sup>

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<sup>1</sup> Indeed.com “Neuroscience Research”

<https://www.indeed.com/jobs?q=neuroscience%20research&l=Florida&vjk=4348cfe768ed0bbc>

<sup>2</sup> Higher Ed Jobs, “Neuroscience”

[https://www.higheredjobs.com/search/advanced\\_action.cfm?OnlyTitle=0&Keyword=Neuroscience](https://www.higheredjobs.com/search/advanced_action.cfm?OnlyTitle=0&Keyword=Neuroscience)

**Table 1: Labor Market Demand, CIP Code 26.1501, 26.1504, 42.2706**

Occupations	FL Change, 2020-28 Percent	National Change, 2020-30 Percent	FL Total Annual Average Job Openings	National Openings, 2020-30 Annual Average	FL Change, 2020-28 Number	National Change, 2020-30 Number	BLS Typical education needed for entry
Biological Science Teachers, Postsecondary	17.6	12.8	206	6,700	323	7,700	Doctoral or professional degree
Biological Scientists, All Other	5.9	3.7	206	4,200	119	1,700	Bachelor's degree
Biological Technicians	9.7	6.7	301	11,800	238	5,900	Bachelor's degree
Natural Sciences Managers	NOT AVAILABLE	5.8	NOT AVAILABLE	6,000	NOT AVAILABLE	4,500	Bachelor's degree
Medical Scientists, Except Epidemiologists	12.4	16.9	425	12,600	478	22,600	Doctoral or professional degree
Life Scientists, All Other	NOT AVAILABLE	8.4	NOT AVAILABLE	600	NOT AVAILABLE	600	Bachelor's degree
Psychologists, All Other	13.5	2.0	171	3,700	252	1,100	Master's degree
Psychology Teachers, Postsecondary	16.9	10.3	141	4,700	215	4,500	Doctoral or professional degree

Sources:

Date Retrieved: 9/23/2021

U.S. Bureau of Labor Statistics - <https://data.bls.gov/projections/occupationProj>

Florida Department of Economic Opportunity - <http://www.floridajobs.org/labor-market-information/data-center/statistical-programs/employment-projections>

### Student Demand for the Program

FAU also provided evidence showing students would be interested in enrolling in the proposed program if implemented. To demonstrate student demand for the program, Table 2 shows the data related to the number of applicants and enrollments in three existing programs that will be merged to create the proposed program. All programs have filled all available seats every year since they were implemented. Currently, there are 409 students enrolled in FAU's neuroscience and behavior major, which may feed into the proposed program. The institution provided additional data on the number of undergraduate programs, including six institutions in Florida, such as Florida State University, and Florida International University, that could potentially feed into the program, which will only be the second graduate neuroscience program in the State University System under CIP 26.1501.

Table 2: Program Enrollment

Department/Program	# of applicants Fall 2016- Fall 2020	Number Admitted 2016-2020	Total # in program Fall 2020-21
Department of Psychology - XPSY	193	48	10 (4 GNTP students) <sup>3</sup>
Integrative Biology-Neuroscience – IB-NS	99	33	21 (8 GNTP students)
Complex Systems and Brain Sciences - CSBS	52	15	15 (6 GNTP students)
Total	344	94	46

### Overall Summary and Board Staff Comments:

The proposed Ph.D. in Neuroscience will leverage FAU's existing resources and strengths in neuroscience, such as current training programs, industry partnerships, and existing research facilities, to provide high-quality instruction and research foundations for students in the proposed program. The institution has provided sufficient evidence of workforce need and student demand. Board staff have no concerns.

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<sup>3</sup> Graduate Neuroscience Training Program (GNTP) – a non-degree awarding program which acts as training and placement tool for the XPSY program, Integrative Biology - Neuroscience track, and Complex Systems and Brain Sciences programs.

### C. Assessment of the University Review Process in accordance with BOG Regulation 8.011

*Prior to submitting a program proposal to the Board of Governors office, the institution and its Board of Trustees are required ensure that all programs meet the requirements of BOG Regulation 8.011. Section C is an assessment of the university's review process to ensure that all criteria have been considered.*

#### **ACCOUNTABILITY**

**Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.**

**1. Overall** – *The proposal is in the correct format, includes all necessary signatures, and contains complete and accurate tables for enrollment projections, faculty effort, and the proposed budget.*

**YES    NO**

    **The proposal has been approved by the university board of trustees and includes all required signatures.**

The program proposal was approved at their April 20, 2021, Board of Trustees meeting.

    **The university has provided a proposal written in the standard SUS format, which addresses new academic program approval criteria outlined in BOG Regulation 8.011.**

FAU submitted the proposed program in the standard SUS format.

    **The pre-proposal was reviewed by the Council of Academic Vice Presidents (CAVP) workgroup and any concerns identified by the group have been listed and addressed in the proposal.**

The CAVP Academic Coordination Group reviewed the pre-proposal on November 7, 2019, and no concerns were expressed.

    **The university has provided data that supports the need for an additional program in the State University System as well as letters of support or concern from the provosts of other state universities with substantially similar programs.**

Currently, one SUS institution, Florida State University, offers a similar doctoral program in the same CIP as the proposed program for FAU. The University of Florida offers a concentration in Neuroscience under their Ph.D. in Biomedical Sciences, and Florida International University and the University of Central Florida offer a Ph.D. in Cognitive Neuroscience. The proposal states that FAU's program differs from the other programs because of its interdisciplinary nature, its management by an institute, the opportunities for interdisciplinary research, and graduate students' exposure to three areas of neuroscience through the three rotations (pp. 27-28).

The proposal received an overall positive response from other System institutions,

including Florida State University and Florida International University. Florida State University noted critical differences in their programs and commented on the high demand (Appendix G). Florida International University commented on the interdisciplinary nature of the program and the opportunity for collaboration (Appendix G).

- The university has provided complete and accurate projected enrollment, faculty effort, and budget tables that are in alignment with each other.**

FAU submitted all required tables in Appendix A.

- The university has included a statement in the proposal signed by the equity officer as to how this proposal will meet the goals of the university's equity accountability plan.**

The Equal Opportunity Officer signed the proposal on November 12, 2020.

- The program does not substantially duplicate programs at FAMU or FIU or, if it does, evidence was provided that consultations have occurred with the affected university on the impact of the new program on existing programs.**

The proposed program does not duplicate an existing program at Florida Agricultural and Mechanical University or Florida International University.

**2. Budget** – *The proposal presents a complete and realistic budget for the program consistent with university and BOG policy and shows that any redirection of funding will not have an unjustified negative impact on other needed programs.*

**YES NO**

- The University Board of Trustees has approved the most recent budget for this proposal.**

The budget for the proposed program was approved in conjunction with the full proposal by the Board of Trustees on April 20, 2021.

- The university has reviewed the budget for the program to ensure that it is complete and reasonable, and the budget appears in alignment with expenditures by similar programs at other SUS institutions.**

The cost per FTE for the proposed program aligns with the 2019-2020 State University System expenditure analysis for graduate programs in the CIP 26.

- The proposal indicates that the program will follow the cost-recovery or market-rate funding models. If so, details and timelines for getting approvals for these funding models are included in the proposal.**

The proposed program will not operate using a cost-recovery or market-rate funding model. FAU will utilize E&G funding to support the program.

- In the event that resources within the institution are redirected to support the new program, the university has identified this redirection and determined**

**that it will not have a negative impact on undergraduate education, or the university has provided a reasonable explanation for any impact of this redirection.**

FAU anticipates that implementation of the program will yield no negative impact on related programs. Three associated programs will be merged into the proposed program upon implementation. The resources related to the three programs will be utilized for the proposed program. Students enrolled in the three related programs will be placed on a teach-out plan and complete the original program of study. Faculty associated with the three programs will maintain appointments in their departments and teach in the proposed program.

### **READINESS**

***Check 'yes' or 'no' box, and make comments beneath criterion as appropriate.***

**3. Program Quality** – *The proposal provides evidence that the university planning activities have been sufficient, and responses to any recommendations to program reviews or accreditation activities in the discipline pertinent to the proposed program have been addressed.*

**YES NO**

**The university has followed a collaborative planning process for the proposed program in accordance with policies and procedures adopted by the University Board of Trustees.**

FAU provided a narrative and chronological table of events that occurred during the development of the proposal as well as a list of the campus constituents involved. The table and the narrative provide sufficient evidence that the institution followed a collaborative planning process according to the policies and procedures adopted by the FAU Board of Trustees.

**An external consultant has reviewed the proposal and supports the department's capability of successfully implementing this new program.**

Two external consultants reviewed the proposal for the program. Dr. Daniel N. Cox, Professor of Neuroscience and Biology, Director of the Center for Neuromics, Director of Graduate Studies in Neuroscience at Georgia State University and Dr. Lucas Pozzo-Miller, Professor of Neurobiology, Co-Director of Comprehensive Neuroscience Center, Co-Director Neuroscience Theme, Graduate Biomedical Sciences at the University of Alabama Birmingham ( Appendix D). Each consultant provided a report expressing positive feedback and fully supporting the proposed program. All feedback and suggestions from both consultants were taken into consideration and implemented within the proposed program proposal.

Recommendations from the consultants are highlighted below, noting where in the proposal the institution has made adjustments.

- adding a written component to the qualifying examination was identified and implemented in the proposed program (p. 10)
- adding clarity and details regarding the source of funding support for students needing more time than the allotted five years (p. 10)
- removing the GRE requirement and making it optional to increase access (p. 10)



- providing clarity for publishing requirements before the final defense (p. 10)
- clarifying details an option to exit the doctoral level program at the ' 'master's level with a master's degree in an allied health STEM area (p. 10)
- creating a seminar series for students in the proposed program of which the Brain Institute will implement this in collaboration with the Neuroscience Student Organization (p. 10)
- implementing an application waiver for students in financial need or from minorities groups in STEM (p. 11)
- adding clarity and details regarding the integration of Broward Health hospitals; FAU noted the creation of the FAU - Memorial Health Systems research partnership in the proposal and exploration of clinical research internships (p. 11)

**The university has found the level of progress that the department has made in implementing the recommendations from program reviews or accreditation activities in the discipline pertinent to the proposed program to be satisfactory.**

FAU summarized recent program reviews for the department of Biological Sciences, Psychology, and the Center for Complex Systems and Brain Sciences conducted in 2015.

Recommendations for the Department of Biological sciences included continuing to build research and instruction capacity on the Boca Raton, Jupiter, and Davie campuses; developing a reliable and efficient transportation system across campuses; and strengthening research productivity by improving the graduate student support package offered to graduate students (pp. 45-46). In response to the recommendations, FAU's President established agreements with Scripps Florida and Max Planck Florida to fortify relationships in research and education across campuses (p. 45), established a free intercampus shuttle service across campuses that is Wi-Fi enabled (p. 45), and increased financial support for graduate students at FAU (p. 46).

Recommendations for the Department of Psychology included creating a 5-year hiring plan for faculty (p. 46), improving graduate student recruitment (p. 46), creating a graduate student handbook (p. 47), creating a sense of community between faculty and graduate students (p. 47), and developing a strategy to coordinate the psychology program across multiple campuses (p. 47). In response to the recommendations, FAU has developed a hiring plan and made several tenure track hires in program areas of greatest departmental need, increased graduate student stipends, created a graduate student handbook, and established a graduate student professional development series (p. 47).

Recommendations for the Center for Complex Brain Systems and Brain Sciences include creating a leadership transition process; defining the center's research focus; increasing faculty members; increasing interaction between neuroscientists from multiple campuses; and increasing collaborations with other colleges at FAU, Max Planck Florida, and Marcus Neuroscience Institute (pp. 47-49). In response to the recommendations, FAU hired a new Executive Director, aligned the research focus of the center with FAU's Neuroscience research pillar, hired several new faculty to join the center staff, and utilized technology and video conferences to

increase interactions between campuses and faculty across the various campuses.

- The university has analyzed the feasibility of providing all or a portion of the proposed program through distance learning.**

The program will be offered primarily through a traditional face-to-face delivery format, with some courses offered online via video conference, WebEx, and Zoom. Additionally, for those students taking courses on different campuses, a free shuttle outfitted with Wi-Fi will make five runs per day between the Jupiter and Boca Raton campuses.

- If necessary, the university has made allowances for licensure and legislative approval to be obtained in a timely manner.**

There is no applicable licensure or legislative approval required for the proposed program.

**4. Curriculum** - *The proposal provides evidence that the university has evaluated the proposed curriculum and found that it describes an appropriate and sequenced course of study and that the university has evaluated the appropriateness of specialized accreditation for the program.*

**YES NO**

- The university has reviewed the curriculum and found that the course of study presented is appropriate to meet specific learning outcomes and industry-driven competencies discussed in the proposal.**

FAU has provided the curriculum for the proposed program, and the coursework is designed to meet the learning outcomes for the degree. Although FAU did not utilize a formal committee, they ensured that the core competencies and skills identified by the Society for Neuroscience National Neuroscience Training Committee were included in the proposed curriculum.

- The university anticipates seeking accreditation for the proposed doctoral program or provides a reasonable explanation as to why accreditation is not being sought.**

There are no specialized accrediting bodies available for doctoral programs in Neuroscience.

**5. Faculty** – *The proposal provides evidence that the university is prepared to ensure a critical mass of faculty will be available to initiate the program based on estimated enrollments and that faculty in the aggregate have the necessary experience and research activity to sustain a doctoral program.*

YES NO

- The university has reviewed the evidence provided and found that there is a critical mass of faculty available to initiate the program based on estimated enrollments.**

FAU identified 60 existing faculty members who will participate in the proposed program, including faculty teaching core courses and elective courses. Thirty-five total faculty will participate by spring 2022, with the remaining 25 by year 5 of the program.

- The university has reviewed the evidence provided and found that the faculty, in aggregate, has the necessary experience and research activity to sustain the program.**

FAU reviewed the credentials of all faculty members participating in the program, and their curriculum vitae were included in Appendix C of the proposal.

- The university has reviewed the evidence provided and found the academic unit(s) associated with this new degree to be productive in teaching, research, and service.**

FAU provided multiple examples showing that the academic units associated with the proposed degree program have been productive in teaching, research, and service. Evidence included program productivity for associated departments, research awards, and publications.

- If appropriate, the university has committed to hiring additional faculty in later years, based on estimated enrollments.**

FAU will not hire additional faculty for the program.

**6. Resources** – *The proposal provides evidence that the university has ensured the available library volumes and serials; classroom, teaching laboratory, research laboratory, office space, equipment, clinical and internship sites, fellowships, scholarships, and graduate assistantships will be sufficient to initiate the program, and that if applicable, funding has been secured to make more resources available as students proceed through the program.*

YES NO

- The university has provided a signed statement from the Library Director verifying that the library volumes and serials available are sufficient to initiate the program.**

The library director signed the proposal on November 15, 2020.

- The university has ensured that the physical space necessary for the proposed program, including classrooms, laboratories, and office space, is sufficient to initiate the program.**

FAU provided descriptions of the physical spaces available to the program, including research, teaching, and office spaces. The proposal identified 110 general classrooms, 210 laboratory classrooms, four specialized computer labs, office spaces for all faculty and research facilities, and labs for graduate students (p. 67). The proposal indicates that no additional spaces are needed to sustain the proposed program.

- The university has ensured that necessary equipment is available to initiate the program.**

FAU has provided multiple examples of equipment available to support the instruction and research of the proposed program.

- The university has ensured that fellowships, scholarships, and graduate assistantships are sufficient to initiate the program.**

FAU indicated that students would receive graduate assistantships and fellowships funded through I-BRAIN, totaling \$240,000 in year 1. By Year 5 of the program, FAU has plans to increase this amount to \$1,440,000, including \$390,450 in contracts and grants, \$1,049,550 in continuing base (p. 69).

- If applicable, the university has ensured that the department has arranged a suitable number of clinical and internship sites.**

Internships are not required for the proposed program. Students will complete all research in the assigned mentor/faculty lab space.