



MEMORANDUM

To: Julio Frenk
University President

From: Linda L. Neider
Chair, Faculty Senate

A handwritten signature in blue ink, appearing to read 'L. Neider', is written over the 'From' field.

Date: March 30, 2020

Subject: Faculty Senate Legislation #2019-65(B) – Creation of a New Minor in Biological Physics (Not for Physics Majors and Minors) – College of Arts and Sciences

The Faculty Senate, at its March 25, 2020 meeting, had no objections to the approval of the College of Arts and Science's creation of a new minor in biological physics for non-Physics majors or minors. This minor uses existing courses within the College of Arts and Sciences.

The proposal is enclosed for your reference.


This legislation is now forwarded to you for your action.

LLN/ss/rh

cc: Jeffrey Duerk, Executive Vice President and Provost
Leonidas Bachas, Dean, College of Arts and Sciences
Massimiliano Galeazzi, Professor and Associate Chair, Department of Physics

CAPSULE: Faculty Senate Legislation #2019-65(B) – Creation of a New Minor in Biological Physics (Not for Physics Majors and Minors) – College of Arts and Sciences

PRESIDENT’S RESPONSE

APPROVED:  DATE: 4/29/20
(President’s Signature)

OFFICE OR INDIVIDUAL TO IMPLEMENT: Dean Leonidas Bachas,
College of Arts and Sciences _____

EFFECTIVE DATE OF LEGISLATION: IMMEDIATELY
(pending any additional approval by the Board of Trustees)

NOT APPROVED AND REFERRED TO: _____

REMARKS (IF NOT APPROVED): _____

Program Change Request

New Program Proposal

Date Submitted: 01/22/20 12:09 pm

Viewing: : **Minor in Biological Physics**

Last edit: 01/22/20 12:09 pm

Changes proposed by: Patty Murphy (pxm491)

In Workflow

1. **PG Assessment and Accreditation**
2. **PG AS Dean**
3. **PG FS Office for UCC**
4. **PG University Curriculum Committee**
5. **PG FS Office for GWC**
6. PG FS GWC
7. PG Faculty Senate
8. PG FS Office for President
9. PG Registrar

Approval Path

1. 02/17/20 10:42 am
Patty Murphy (pxm491): Approved for PG Assessment and Accreditation
2. 02/17/20 4:50 pm
Leonidas Bachas (l.bachas): Approved for PG AS Dean
3. 02/17/20 5:11 pm
Robyn Hardeman (rhardeman): Approved for PG FS Office for UCC
4. 02/26/20 3:39 pm
David Chin (dchin1): Approved for PG

Please list the authors of this proposal including name, rank/title, program/department, and school.

Proposer(s) Name

Questions about this proposal should be directed to:

Massimiliano Galeazzi, Ph.D.
 Professor and Associate Chair
 Department of Physics
 College of Arts & Sciences
 #306-284-7141
 m.galeazzi@miami.edu

EXECUTIVE SUMMARY

The Department of Physics has recently expanded its vision to include interdisciplinary work, including new course offerings collaborations with other units across the university. Two areas where the Department of Physics is particularly active are Biological physics and Astrophysics. In order to enhance that collaboration, and in the spirit of the university's commitment to interdisciplinarity, the Department of Physics is proposing to offer a new minor in Biological Physics (not for Physics majors or minors). This minor uses existing courses within the College of Arts and Sciences.

Career Undergraduate

Academic Structure

School/ College	Department
College of Arts and Sciences	Physics

Plan Type Minor

Who can take this program? Any Student at University of Miami

Proposed Plan Code

Plan Name Minor in Biological Physics

Effective Term Fall 2020

First Term Valid Fall 2020

Program Instruction Mode In Person

Where is the program offered?

Location	Please provide the % of instruction at each location.
Coral Gables Campus	100

Total Credits 19-20

Areas of Knowledge

STEM

To Be Published in the Academic Bulletin

Program Overview

The Biological Physics minor is for non-Physics majors or minors and requires 11 to 12 credits within the Department of Physics (depending on the University Physics sequence taken), and 6 credits from the Department of Biology. In addition to a calculus-based introductory sequence of physics courses, students will take the 300-level Biological Physics I course.

Biological physics covers a vast array of research topics, from the molecular scale to whole organisms and populations. It is an inherently interdisciplinary subject, where the fields involved (physics, biology, neuroscience, etc.) strengthen each other. The methods of physics have influenced how biology research is conducted, and basic questions in biology and neuroscience have attracted the attention of both experimental and theoretical physicists. A biological physics minor is designed to strengthen the quantitative and problem-solving skills for non-physics majors with interest in biological questions.

Curriculum Requirements

Curriculum Requirements

Course List

Code	Title	Credit Hours
University Physics (Complete one of the following sequences)		8-9
PHY 201 & PHY 202	University Physics I for the Sciences and University Physics II for the Sciences	
PHY 211 & PHY 212	University Physics I for PRISM and University Physics II for PRISM	
PHY 221 & PHY 222 & PHY 223	University Physics I and University Physics II and University Physics III	

Code	Title	Credit Hours
PHY 221 & PHY 230	University Physics I and Honors University Physics II-III	
General Biology & Evolution and Biodiversity (Complete both of the following)		8
BIL 150	General Biology	
BIL 160	Evolution and Biodiversity	
Biological Physics (Complete the following)		3
PHY 325	Biological Physics I	
Total Credit Hours		19-20

Rationale

Rationale

Market Demand

Relationship to Other Programs

Library Resources Available and Needed to Support the Program

Laboratory Facilities, Equipment, and Space Available and Needed to Support the Program

Other Resources Available or Needed to Support the Program

Curriculum

Program Curriculum

RATIONALE

The College of Arts & Sciences' Department of Physics seeks to offer a new undergraduate minor in Biological Physics (not for Physics majors or minors).

Purpose and Goals

For the past several years, the University, and the College of Arts and Sciences in particular, has been expanding the educational opportunities for students by exploring interdisciplinary areas of study that do not always fit in the traditional core mission of Departments. In parallel to the educational expansion at the undergraduate level, areas of research have also expanded into more interdisciplinary areas, with active collaborations between faculty members across Departments and Schools. The Department of Physics, while strengthening the core research

areas of the Department, has expanded its vision to include interdisciplinary work, both with new hires, new course offerings, and new collaborations across UM campuses. Two areas where the Department of Physics is particularly active in such respects are Biological physics and Astrophysics.

Motivation and Demand

Offering students this interdisciplinary minor within the department provides them opportunities to work in active research not only within the department, but to also be exposed to research from another collaborative unit.

Another rationale behind offering this new minor is to involve students in this new area of study so they can begin to be trained and prepared for future opportunities at the graduate level or in the job market in such fields. This minor is designed for students pursuing a major other than Physics.

List the major division(s) of the discipline in which the degree work will be offered.

The Department of Physics in the College of Arts & Sciences will offer this new minor, with the cooperation of the Department of Biology. Administration of the minor will take place in the College of Arts & Sciences.

Description of the Biological Physics Minor

Biological physics covers a vast array of research topics, from the molecular scale to whole organisms and populations. It is an inherently interdisciplinary subject, where the fields involved (physics, biology, neuroscience, etc.) strengthen each other. Biological physics has grown dramatically in recent years, and so has student interest at UM. The methods of physics have influenced how biology research is conducted, and basic questions in biology and neuroscience have attracted the attention of both experimental and theoretical physicists. A biological physics minor would serve to strengthen the quantitative and problem-solving skills for non-physics majors with interest in biological questions. The minor will require 11 or 12 credits within the Department of Physics (depending on the University Physics sequence taken), and 6 credits from the Department of Biology. In addition to a calculus-based introductory sequence of physics courses, students will take the 300-level Biological Physics I course.

Pre-requisites

All students who choose to declare this minor must be undergraduates at the University of Miami in good academic standing.

The Biological Physics minor is not open to students who declare Physics as their major or minor.

Assessment of Library Holdings

The University of Miami Library system has an extensive collection of materials related to biological physics available at the Richter Library and online. In addition, the Department of Physics has a large Physics Library, situated on the third floor of the Knight Building, with ample resources available to students in this minor.

Physical Resources: Existing Facilities, Equipment, and Space

Laboratory facilities to support student research are already in the departments responsible for this minor, including laboratories dedicated to complexity and biological physics. No additional space or equipment will be required to offer this minor.

Additional Faculty

The proposed minor uses courses that are already in the bulletin and we do not expect to need additional faculty at this time.

Budget

The minor will fall under the administration of the Department of Physics and any financial requirements will be covered by the department's existing budget. No new funds or personnel will be needed at this time.

Upload Syllabi for Any New Courses

CIP Code

Proposed CIP Code 26.0203 - Biophysics.

Faculty

Program Directors

N/A

Upload CV(s)

Program Faculty

N/A

Documents

Attach Supporting Documentation

[PHY Minors Letters of Support.pdf](#)

Reviewer

Comments

Patty Murphy (pxm491) (02/17/20 10:38 am): As noted in the attached letter from the Department Chair, the Department of Physics faculty voted to approve this proposal on March 30, 2019

Patty Murphy (pxm491) (02/17/20 10:42 am): This new minor is a repackaging of existing courses and therefore, does not constitute a significant departure from currently approved programs. Consequently, notification to or approval from SACSCOC is not required.

Leonidas Bachas (l.bachas) (02/17/20 4:50 pm): The A&S faculty voted to approve this proposal on Sept 17, 2019. I support this proposal.

David Chin (dchin1) (02/26/20 3:39 pm): On 2/26/20 the University Curriculum Committee voted to support this proposal as submitted.

Key: 521



To: Curriculum Committee,
College of Arts and Sciences

From: Joshua Cohn
Professor and Chair
Department of Physics

A handwritten signature in black ink that reads "Joshua Cohn".

Date: April 1, 2019

Subject: New Physics Minors

Three new physics minors, "Biological Physics," "Astrophysics," and "Computational Astrophysics," were unanimously approved by the physics faculty at a meeting on March 30, 2019.

UNIVERSITY
OF MIAMI



Athula H. Wikramanayake, Ph.D.
Professor and Chair
Department of Biology
215 Cox Science Center
1301 Memorial Drive
Coral Gables, Florida 33146-0421
Ph. 305-284-3988
athula@miami.edu

MEMORANDUM

DATE: 1 April, 2019

TO: Massimiliano Galeazzi, Ph.D.
Professor and Associate Chair
Department of Physics

FROM: Athula Wikramanayake, Ph.D.
Professor and Chair
Department of Biology

RE: Proposal for Biological Physics minor

I am writing to express my support for the proposal to offer a minor in Biological Physics through the Department of Physics. I have read your proposal and I believe that the proposed minor in Biological Physics would be attractive to some of our Biology majors. The Department of Biology will be happy to help you recruit students to enroll in this minor once it has been approved by the CAS and the Faculty Senate.

UNIVERSITY
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Department of Computer Science

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April 1, 2019

To: Massimiliano Galeazzi
From: Geoff Sutcliffe
Subject: Minor in Computational Astrophysics

The Department of Computer Science supports the proposed Minor in Computational Astrophysics, and is pleased to have CSC120 as one of the required courses.

A handwritten signature in black ink, appearing to read 'Geoff Sutcliffe'.

Geoff Sutcliffe
Professor and Chair of Computer Science