**MEMORANDUM TO:** Ogden College of Science and Engineering Curriculum Committee

Dr. Melanie Autin                    Dr. Andy Mienaltowski
Dr. Nahid Gani                       Dr. Les Pesterfield
Dr. Scott Grubbs                     Dr. Todd Willian
Dr. Ting-Hui Lee                     Mr. Jason Wilson
Dr. Jeremy Maddox

**FROM:** Dr. Stuart Burris, Chair

**SUBJECT:** Agenda for <u>Thursday, September 7, 2023</u>

**A. OLD BUSINESS:**
    I.     Consideration of the minutes of the April 6, 2023 meeting.

**B. NEW BUSINESS:**

| Type of item | Description of Item & Contact Information |
|---|---|
| Informational Proposals not attached. | <u>**The following items were sent through the expedited process:**</u><br>**Proposal to Add or Revise Course Student Learning Outcomes & Content Outlines**<br>All PHYS Department Courses (ASTR & PHYS prefixes) |
| Action | **Proposal to Suspend a Course**<br>PHYS 410, Physics for Teachers<br>Contact: Michael Carini, mike.carini@wku.edu |
| Action | **Proposal to Revise a Program**<br>Ref. 1748, Emergency Management Disaster Science Certificate<br>Contact: David Oliver, David.oliver@wku.edu<br>Contact: Joshua Durkee, Joshua.durkee@wku.edu |
| Action | **New Course Proposal**<br>NEUR 175, Neuroscience Seminar 1<br>Contact: Lance Hahn, lance.hahn@wku.edu |
| Action | **New Course Proposal**<br>NEUR 300, Writing in Neuroscience<br>Contact: Gordon Baylis, gordon.baylis@wku.edu |
| Action | **New Course Proposal**<br>NEUR 310, Research Techniques in Neuroscience<br>Contact: Gordon Baylis, gordon.baylis@wku.edu |
| Action | **New Course Proposal**<br>NEUR 401, Cellular and Molecular Neuroscience<br>Contact: Michael Smith, michael.smith1@wku.edu |
| Action | **New Course Proposal**<br>NEUR 4025, System Neuroscience<br>Contact: Hilary Katz, hilary.katz@wku.edu |
| Action | **New Course Proposal**<br>NEUR 498, Neuroscience Seminar 2<br>Contact: Lance Hahn, lance.hahn@wku.edu |

| Action | **New Program Proposal** |
|---|---|
| | Ref. TBA: Neuroscience, B.S. |
| | Contact: Gordon Baylis, gordon.baylis@wku.edu |

C. **OTHER BUSINESS**
    Calendar Review and Notes

**Minutes – OCSE Curriculum Committee**                              **April 2023**

**Members Present:**
Dr. Melanie Autin
Dr. Nahid Gani
Dr. Dr. Scott Grubbs
Dr. Ting-Hui Lee
Dr. Jeremy Maddox
Dr. Andy Mienaltowski
Dr. Les Pesterfield
Dr. Todd Willian
Mr. Jason Wilson

Guests: Dr. Dan Strunk and Dr. Scott Bonham

**FROM:** Dr. Stuart Burris, Chair

The meeting was called to order at 4:00pm.

**OLD BUSINESS:**

Minutes from the March 2023 meeting were approved with a friendly amendment to correct the spelling of Dr. Ting-Hui Lee's last name.

**NEW BUSINESS:**

**Action Agenda:**
AGRI 101: Autin, Wilson; approved.
AGRI 381: Grubbs, Autin; approved with friendly amendment.
PHYS 401: Maddox, Grubbs; approved.
Ref. 731P/731 Mathematical Economics: Autin, Willian; approved.

**Other Business:**
None

Adjourned at 4:15

# Course Change Request

## Course Suspension

Date Submitted: 08/21/23 4:22 pm

## Viewing: **PHYS 410 : Physics for Teachers**

## Last revision: 08/21/23 4:22 pm

Changes proposed by: jss08071

Catalog Pages
referencing this
course
  Department of Physics and Astronomy
  Physics (PHYS)

Proposed Action

### In Workflow

1. **PHYA Approval**
2. **PHYA Approval**
3. **SC Dean**
4. **Professional Education Council**
5. Undergraduate Curriculum Committee
6. University Senate
7. Provost
8. Course Inventory
9. Michael Carini

### Approval Path

1. 08/02/23 2:22 pm Michael Carini (mike.carini): Approved for PHYA Approval
2. 08/15/23 8:46 am Stuart Burris (stuart.burris): Rollback to PHYA Approval for SC Dean
3. 08/15/23 8:56 am Michael Carini (mike.carini): Approved for PHYA Approval
4. 08/15/23 9:33 am Stuart Burris (stuart.burris): Rollback to Initiator
5. 08/21/23 4:26 pm Michael Carini (mike.carini): Approved for PHYA Approval

6. 08/29/23 8:48 am
   Michael Carini
   (mike.carini):
   Approved for PHYA
   Approval
7. 08/29/23 8:55 am
   Stuart Burris
   (stuart.burris):
   Approved for SC
   Dean

~~Active~~

Suspended

Contact(s)

| Name | E-mail | Phone |
|------|--------|-------|
| Michael Carini | mike.carini@wku.edu | 2707456198 |

Review Type            Full Review

Term for               Fall 2023
implementation

Academic Level         Undergraduate

Equivalent Courses

Have you contacted     N/A
impacted
departments?

Reason for
suspending or
deleting the
proposed course

The course has been replaced in the curriculum by the sequence of Physics 415/416/417.

What departments/programs have been consulted concerning potential impact (e.g. to possible duplication or conflict, changed corequisite or prerequisite for equivalent courses, etc.)? Please provide names and dates for individuals consulted.

SKyTeach and Middle Grades Education (Les Pesterfield and Martha Day)were notified in fall semester of 2022 of the impending suspension of this course when the Physics 415/416/417 courses were implemented.

Effect on programs
or other departments

[None](#)

Reviewer Comments

**Stuart Burris (stuart.burris) (08/15/23 8:46 am):** Rollback: This does need to go through Full Review (needs to go to PEC), but the workflow is currently set to Expedited (even though the dropdown says Full). I'm sending it back to you, so that will reset to Full workflow.

**Stuart Burris (stuart.burris) (08/15/23 9:33 am):** Rollback: The reset didn't work because I sent it to PHYA instead of to Mike. Sorry, but please send it back through. Please flip the state of Review Type back and forth from Full to Expedited to Full to be sure that part resets to Full.

Key: 7115

# Program Change Request

Date Submitted: 07/30/23 10:18 pm

Viewing: **1748 : Emergency Management Disaster Science, Certificate**

Last approved: 07/05/23 11:18 am

Last edit: 08/30/23 5:04 pm

Changes proposed by: dvd62010

Catalog Pages
Using this Program
  Emergency Management Disaster Science, Certificate (1748)

Proposed Action

Active

Contact Person

| Name | Email | Phone |
| --- | --- | --- |
| Joshua.durkee | joshua.durkee@wku.edu | 270-745-8777 |
| David Oliver | david.oliver@wku.edu | 270-745-4181 |

## In Workflow

1. **99SC Approval**
2. SC Dean
3. SC Curriculum Committee
4. Undergraduate Curriculum Committee
5. University Senate
6. Provost
7. Program Inventory

## Approval Path

1. 07/30/23 2:55 pm Stuart Burris (stuart.burris): Rollback to Initiator

## History

1. May 26, 2021 by Rheanna Plemons (rheanna.plemons)
2. Sep 20, 2021 by Jennifer Hammonds (jennifer.hammonds)
3. Mar 2, 2023 by Joshua Durkee (joshua.durkee)
4. Jul 5, 2023 by Jessica Dorris (jessica.dorris)

| Term of Implementation | 2024-2025 |
|---|---|

| Program Reference Number | 1748 |
|---|---|

| Review Type | Full Review |
|---|---|

| Academic Level | Undergraduate |
|---|---|

| Program Type | Certificate - Undergraduate |
|---|---|

| Department | OCSE Interdisciplinary Programs |
|---|---|

| College | Science and Engineering |
|---|---|

| Program Name (eg. Biology) | Emergency Management Disaster Science, Certificate |
|---|---|

Will this program have concentrations?
   No

| CIP Code | 43.0302 - Crisis/Emergency/Disaster Management. |
|---|---|

| Will this program lead to teacher certification? | No |
|---|---|

Does the proposed program contain 25% or more new content not previously taught in another course at WKU? If yes, contact the Office of the Provost for additional SACSCOC proposal requirements

# Catalog Content

Program Overview (Catalog field: Overview tab)

The certificate provides students, whether traditional or working professionals, an in-depth acumen related to incident management, risk identification, emergency planning, and emergency management program evaluation.

Curriculum Requirements (Catalog field: Program Requirements)

# Program Requirements (15 hours)

**Program Courses:**

| EMDS 400 | Emergency Management Policy and Practices | 3 |
|---|---|---|
| EMDS 401 | Natural and Technological Disaster Risks [1,2] | 3 |
| EMDS 402 | Resiliency in Response to Terrorism and Violence | 3 |
| EMDS 403 | Advanced Disaster Planning, Management, and Preparedness [1,2] | 3 |

| | | |
|---|---|---|
| ~~Select one of the following choices:~~ | | ~~3~~ |
| ~~EMDS 404~~ | ~~Trends in Disaster Preparedness and Management~~ | |
| ~~Six hours of upper division courses~~ [1] | | |
| Total Hours | | 12 |

[1]
Students from other disciplines (Education Administration, Leadership, Engineering, Meteorology, etc.) may substitute up to three credit hours from within their discipline, with the approval of the program coordinator, in lieu of EMDS 401 and/or EMDS 403.

[2]

EMDS 404 may be substituted for either EMDS 401 or EMDS 403.

Will this program be managed or owned by more than one department?

No

Does this program include courses from outside your department?

Please insert one Learning Outcome per box. Click green plus sign for additional LO boxes

Learning Outcomes
and Measurement
Plan

| | **List all student learning outcomes of the program.** | **Measurement Plan** |
|---|---|---|
| SLO 1 | Demonstrate an understanding of incident management. | A traditional assessment that ties together key elements from previously required courses toward a comprehensive understanding of how to plan, mitigate, and expect post-disaster fallout of various environmental emergencies. In addition to final grades, a separate final comprehensive assessment is used to determine overall skill, whereby a pass is considered no less than 80% successful completion of the assessment. |
| SLO 2 | Demonstrate an understanding of risk identification. | A traditional assessment that ties together key elements from previously required courses toward a comprehensive understanding of how to plan, mitigate, and expect post-disaster fallout of various environmental emergencies. In addition to final grades, a separate final comprehensive assessment is used to determine overall skill, whereby a pass is considered no less than 80% successful completion of the assessment. |

| | List all student learning outcomes of the program. | Measurement Plan |
|---|---|---|
| SLO 3 | Demonstrate an understanding of emergency planning. | A traditional assessment that ties together key elements from previously required courses toward a comprehensive understanding of how to plan, mitigate, and expect post-disaster fallout of various environmental emergencies. In addition to final grades, a separate final comprehensive assessment is used to determine overall skill, whereby a pass is considered no less than 80% successful completion of the assessment. |

*Assessment Template: https://www.wku.edu/academicaffairs/ee/assurance_learning_resources.php*

Upload Assessment
Plan

# Delivery Mode

Is 25% or more of this program offered at a location other than main campus?

No

Enter Location(s)
and Percentage of
Program Offered at
Location(s)

Is 50% or more of this program offered by distance education (online asynchronous, online synchronous, connected classrooms, etc.)?

Yes

Do you plan to offer 100% of this program online?

Yes

Do you plan to offer 100% of this program face-to-face?

No

If no, enter the percentage of the program that
is taught face-to-face

0

Do you plan to offer at least 25% of this program as a direct assessment competency-based educational program?

No

*See the SACSCOC Policy on Direct Assessment Competency-based Educational Programs.*
*https://www.sacscoc.org/pdf/081705/DirectAssessmentCompetencyBased.pdf*

Rationale for the program proposal?

Modify number of credit hours required for certificate program from 15 to 12. Courses will remain as they are currently, EMDS 404 may be used as a substitute for EMDS 401 or 403 if approved by program faculty.

Additional
Attachments

Additional information or attachments

This revision is based on benchmarking of other programs at WKU and other institutions. The 12 hour format will make the certificate integrate easier with undergraduate degree programs.

Reviewer Comments

**Stuart Burris (stuart.burris) (07/30/23 2:55 pm):** Rollback: Program revisions other than delete/suspend and reactivate without impact on other units are full review items. Change to Full Review in the dropdown and you will also then have access to the fields to make the changes in the description provided.

Key: 273

# Course Change Request

## New Course Proposal

Date Submitted: 09/01/23 5:09 pm

## Viewing: **NEUR 175 : Neuroscience Seminar 1**

### Last revision: 09/01/23 5:34 pm

Changes proposed by: str18637

Programs
referencing this
course

: Neuroscience

Proposed Action

Active

Contact(s)

| Name | E-mail | Phone |
|------|--------|-------|
| Lance Hahn | Lance.Hahn@wku.edu | 2707453918 |

| | |
|---|---|
| Term for implementation | Fall 2024 |
| Academic Level | Undergraduate |
| Course prefix (subject area) | NEUR - Neuroscience |

Course number 175

| | |
|---|---|
| Department | OCSE Interdisciplinary Programs |
| College | Science and Engineering |
| Course title | |

Neuroscience Seminar 1

Abbreviated course
title

NEUROSCIENCE SEMINAR 1

Course description

Transition to university experience for Neuroscience majors. Topics include learning skills, campus resources, research tools, exploration of major, specializations within the discipline, career trends, and professional development.

Credit hours          1

Repeatable
  Yes
    Number of repeats       2
    For maximum credits          1

Default grade type       Standard Letter          Alternate grade type(s)

Is this course intended to span more than one term?

  No

Schedule type
  Seminar

CIP Code             261501 - Neuroscience.

Does this course have prerequisites

  No

Corequisites

Equivalent Courses

## Restrictions:

------------------------------------------------------------------------

College restriction?     Yes

Select:
  Include

College:

| College |
| --- |
| Science and Engineering |

Field of study
restriction/major?

No

Classification                    No
restriction?

Departmental
Restrictions


Reason for
developing the
proposed course
   Introduction to the Neuroscience major and field for the new Neuroscience major.


Is this related to
other courses at
WKU?
   Yes

Related courses
   PSYS 175 - University Experience

What departments/programs have been consulted concerning potential impact (e.g. to possible duplication or conflict,
changed corequisite or prerequisite for equivalent courses, etc.)? Please provide names and dates for individuals
consulted.

   Psychology and Biology departments
   May 17 2023
   BIOL: Michael Smith, Hilary Katz
   PSYS: Lance Hahn, Gordon Baylis

How many sections
of this course per
academic year will
be offered?
   1

How many students
per section are
expected to enroll in
this proposed
course?
   25

How many students
per academic year
are expected to
enroll?
   25

How were these
projections
calculated? Explain

any supporting
evidence/data you
have for arriving at
these projections:

A rough estimate of initial enrollments in the new major, based on the trajectory of a similar major that was launched at NKU.

How are these
related?

NEUR 175 and PSYS 175 are related in that the are both introductions to their respective disciplines and majors and these fields overlap in some areas.

Is this course part of     No
a program that leads
to teacher
certificate?

Are you seeking        No
Colonnade approval
for this course?

Student Learning
Outcomes

| # | Student Learning Outcomes |
|---|---|
| 1 | Describe the different tracks of study within neuroscience |
| 2 | Recognize the resources available to them at the university and part of professional organizations that will facilitate training in the discipline |
| 3 | Discuss examples of research activities that students pursue as undergraduates |

Content outline

| # | Topic |
|---|---|
| 1 | Professional training tracks within neuroscience |
| 2 | Student engagement through internships and research |
| 3 | The scientist-practitioner model |
| 4 | Orientation to scientific discovery |
| 5 | Preparation for careers in neuroscience |

Student
expectations and
requirements

Students will actively participate in discussions led by faculty in the discipline.

Students will gain an understanding of the Neuroscience major and develop a plan for their collegiate career.

Tentative texts and
course materials
    There are no required texts for this course

Special equipment,
materials, or library
resources needed
    None

Additional
information


Supporting
documentation
    Syllabus NEUR 175 SAMPLE.pdf

Reviewer Comments


Key: 9709

# Course Change Request

## New Course Proposal

Date Submitted: 09/01/23 5:34 pm

### Viewing: **NEUR 300 : Writing in Neuroscience**

### Last revision: 09/01/23 5:34 pm

Changes proposed by: str18637

Programs
referencing this
course

: Neuroscience

Proposed Action

Active

Contact(s)

| Name | E-mail | Phone |
|------|--------|-------|
| Gordon Baylis | gordon.baylis@wku.edu | 2707924225 |

| | | | |
|---|---|---|---|
| Term for implementation | Fall 2024 | | |
| Academic Level | Undergraduate | | |
| Course prefix (subject area) | NEUR - Neuroscience | Course number | 300 |
| Department | OCSE Interdisciplinary Programs | | |
| College | Science and Engineering | | |

### In Workflow

1. **99SC Approval**
2. **SC Dean**
3. **SC Curriculum Committee**
4. Colonnade Committee
5. Undergraduate Curriculum Committee
6. University Senate
7. Provost
8. Course Inventory

### Approval Path

1. 09/01/23 5:36 pm Stuart Burris (stuart.burris): Approved for 99SC Approval
2. 09/01/23 5:39 pm Stuart Burris (stuart.burris): Approved for SC Dean

Course title
   Writing in Neuroscience

Abbreviated course        WRITING IN NEUROSCIENCE
title

Course description
   How to write about research in neural and behavioral science within the discipline and for a lay audience.
   Includes learning how to write in the appropriate format for publishing an article in a major journal in
   neuroscience within the areas of Biology, Chemistry, Psychological Science, or Computer Science.

Credit hours                    3

Repeatable
   Yes
      Number of repeats        2

      For maximum credits                3

Default grade type        Standard Letter          Alternate grade type(s)

Is this course intended to span more than one term?

   No

Schedule type
   Lecture

CIP Code                  261501 - Neuroscience.

Does this course have prerequisites

   Yes

Prerequisites

| And/Or | ( | Course/Test Code | Min Grade/Score | Academic Level | ) | Concurrency? |
|---|---|---|---|---|---|---|
|  |  | ENG 200 | D | UG |  |  |
| And | ( | PSYS 160 | D | UG |  |  |
| Or |  | BIOL120 | D | UG |  |  |
| Or |  | CHEM120 | D | UG | ) |  |
| And |  | PSYS210 |  |  |  |  |

Corequisites

Equivalent Courses

## Restrictions:

College restriction?          Yes

Select:
   Include

College:

| College |
| --- |
| Science and Engineering |

Field of study               No
restriction/major?

Classification               No
restriction?

Departmental
Restrictions


Reason for
developing the
proposed course
   To ensure that students can write in the discipline of Neuroscience in order to prepare them for a career in
   scientific research or clinical practice (the careers to which this major tracks students).


Is this related to
other courses at
WKU?
   No

What departments/programs have been consulted concerning potential impact (e.g. to possible duplication or conflict,
changed corequisite or prerequisite for equivalent courses, etc.)? Please provide names and dates for individuals
consulted.

   Psychological Sciences - August 2023

How many sections
of this course per
academic year will
be offered?
   1

How many students
per section are
expected to enroll in
this proposed
course?
   25

How many students per academic year are expected to enroll?

25

How were these projections calculated? Explain any supporting evidence/data you have for arriving at these projections:

Estimates of enrollments based on the trajectory of a similar program launched at NKU

Is this course part of a program that leads to teacher certificate?    No

Are you seeking Colonnade approval for this course?    Yes

Colonnade Programs    Foundations

Foundations: Course Categories    Writing in the Disciplines

Colonnade Proposal    NEUR300 Colonnade Proposal.doc

Syllabus    NEUR300 Syllabus.docx

Colonnade Learning Outcomes

| # | Colonnade Learning Outcomes |
|---|---|
| 1 | Demonstrate the ability to write clear and effective prose in several forms, using conventions appropriate to audience (including academic audiences), purpose, and genre. |
| 2 | Demonstrate the ability to find, analyze, evaluate, and cite pertinent primary and secondary sources, including academic databases, to prepare written texts |
| 3 | Demonstrate the ability to identify, analyze, and evaluate statements, assumptions, and conclusions representing diverse points of view, and construct informed, sustained, and ethical arguments in response |
| 4 | Demonstrate the ability to plan, organize, revise, practice, edit, and proofread to improve the development and clarity of ideas |
| 5 | Distinguish among various kinds of evidence by identifying reliable sources and valid arguments |

Student Learning
Outcomes

| # | Student Learning Outcomes |
|---|---|
| 1 | Write a scientific article in a discipline of neuroscience |
| 2 | Write an abstract for an article, poster, or talk |
| 3 | Give an effective oral presentation of research results |
| 4 | Give an effective poster presentation of research results |
| 5 | Write for non-experts |
| 6 | Incorporate feedback into your work to communicate more effectively to your audience |
| 7 | Learn how to criticize, and to accept criticisms, with grace. |

Content outline

| # | Topic |
|---|---|
| 1 | Read, understand, and summarize scientific papers |
| 2 | Construct a journal article |
| 3 | Construct a powerpoint presentation and a poster |
| 4 | Writing for a lay audience |
| 5 | Introductory grant writing / pitching |

Student
expectations and
requirements


Tentative texts and
course materials
   1) American Psychological Association (2020). Concise Guide to APA Style, 7th ed. Washington, D.C.: American
   Psychological Association.
   2) R. Eric Landrum (2021). Undergraduate Writing in Psychology, 3rd ed. Washington, D.C.: American
   Psychological Association.

Special equipment,
materials, or library
resources needed
   none

Additional
information

Supporting
documentation

[NEUR300 Syllabus.docx](#)

[NEUR300 Schedule.docx](#)

Reviewer Comments

Key: 9701

# Course Change Request

## New Course Proposal

Date Submitted: 09/01/23 5:15 pm

## Viewing: **NEUR 310 : Research Techniques of Neuroscience**

## Last revision: 09/01/23 5:15 pm

Changes proposed by: str18637

Programs
referencing this
course

: Neuroscience

Proposed Action

Active

Contact(s)

| Name | E-mail | Phone |
|---|---|---|
| Gordon Baylis | gordon.baylis@wku.edu | 270-792-4225 |

| Term for implementation | Fall 2024 | | |
|---|---|---|---|
| Academic Level | Undergraduate | | |
| Course prefix (subject area) | NEUR - Neuroscience | Course number | 310 |
| Department | OCSE Interdisciplinary Programs | | |
| College | Science and Engineering | | |
| Course title | | | |

### In Workflow

1. **99SC Approval**
2. **SC Dean**
3. **SC Curriculum Committee**
4. Undergraduate Curriculum Committee
5. University Senate
6. Provost
7. Course Inventory

### Approval Path

1. 09/01/23 5:36 pm Stuart Burris (stuart.burris): Approved for 99SC Approval
2. 09/01/23 5:40 pm Stuart Burris (stuart.burris): Approved for SC Dean

Research Techniques of Neuroscience

Abbreviated course
title

NEUROSCIENCE TECHNIQUES

Course description

Introduction to the many different research techniques used in the field of in neuroscience. This begins by surveying the different approaches, and moves on to discuss how effective research entails the use of different methods whose advantages and disadvantages are complementary.

Credit hours             3

Repeatable
   Yes
      Number of repeats      2

      For maximum credits            3


Default grade type      Standard Letter          Alternate grade type(s)


Is this course intended to span more than one term?


   No

Schedule type
   Lecture

CIP Code               261501 - Neuroscience.

Does this course have prerequisites


   Yes


Prerequisites

| And/Or | ( | Course/Test Code | Min Grade/Score | Academic Level | ) | Concurrency? |
|--------|---|------------------|-----------------|----------------|---|--------------|
|        | ( | PSYS160 | C | UG |   | No |
| Or     |   | BIOL120 | C | UG |   | No |
| Or     |   | CHEM120 | C | UG | ) | No |
| And    |   | PSYS210 | C |    |   | No |

Corequisites

Equivalent Courses

**Restrictions:**
-----------------------------------------------------------------------------------------------------------

College restriction?          Yes

Select:
  Include

College:

| College |
| --- |
| Science and Engineering |

Field of study            No
restriction/major?

Classification            No
restriction?

Departmental
Restrictions

Reason for
developing the
proposed course
  The new major in Neuroscience needs to have an introductory survey of the technical methods of Neuroscience,
  because they are so broad, far-reaching, and rapidly developing. Understanding the technical methods is crucial
  to students choosing a track within the major, and to choosing a laboratory in which to gain research experience.

Is this related to
other courses at
WKU?
  No

What departments/programs have been consulted concerning potential impact (e.g. to possible duplication or conflict,
changed corequisite or prerequisite for equivalent courses, etc.)? Please provide names and dates for individuals
consulted.

  Biology
  Chemistry
  Computer Science
  Psychological Science

How many sections
of this course per
academic year will
be offered?
  1

How many students
per section are
expected to enroll in
this proposed
course?

25

How many students
per academic year
are expected to
enroll?
   25

How were these
projections
calculated? Explain
any supporting
evidence/data you
have for arriving at
these projections:
   A rough estimate of initial enrollments in the new major, based on the trajectory of a similar major
   that was launched at NKU.

Is this course part of     No
a program that leads
to teacher
certificate?

Are you seeking     No
Colonnade approval
for this course?

Student Learning
Outcomes

| # | Student Learning Outcomes |
|---|---|
| 1 | Describe technical methods in Neuroscience |
| 2 | Explain how data from experiments links to the conceptual design of those experiments, and their applicability to the real world. |
| 3 | Describe how ethical guidelines constrain the types of research in neuroscience |
| 4 | Explain how different techniques map onto differences in experimental and non-experimental research designs |

Content outline

| # | Topic |
|---|---|
| 1 | Non-Invasive Brain Imaging |
| 2 | Animal Behavior |
| 3 | Stereotaxic surgery |
| 4 | Electrophysiology |

| # | Topic |
|---|---|
| 5 | Microscopy |
| 6 | Visualizing neural dynamics |
| 7 | Manipulating neural dynamics |
| 8 | Genomics and proteomics |
| 9 | Recombinant DNA Technology |
| 10 | Gene delivery |
| 11 | Genetically modified organisms |
| 12 | Cell Culture |
| 13 | Intracellular signaling |
| 14 | Combined approaches |

Student
expectations and
requirements
　Learn and understand material; meet the basic learning outcomes; be able to explain what "neuroscience"
　means as a field. We expect some basic ability to talk about concepts, to argue points, and to present an
　experiment to the class.

Tentative texts and
course materials
　Guide to Research Methods in Neuroscience (3rd Ed.) Matt Carter, Rachel Essner, Nitsan Goldstein, and Manasi
　Iyer. Academic Press 2022.

　A small packet of copies of journal articles on freshly-developed techniques (e.g., tFUS) will also be used.

Special equipment,
materials, or library
resources needed
　none

Additional
information

Supporting
documentation
　NEUR310 Schedule.docx
　NEUR310 Syllabus.docx

Reviewer Comments

Key: 9702

# Course Change Request

## New Course Proposal

Date Submitted: 09/01/23 5:16 pm

## Viewing: **NEUR 401 : Cellular and Molecular Neuroscience**

### Last revision: 09/01/23 5:16 pm

Changes proposed by: str18637

Programs
referencing this
course

  : Neuroscience

Proposed Action

Active

Contact(s)

| Name | E-mail | Phone |
|---|---|---|
| Michael Smith | michael.smith1@wku.edu | 270-745-2405 |

| | |
|---|---|
| Term for implementation | Fall 2024 |
| Academic Level | Undergraduate |
| Course prefix (subject area) | NEUR - Neuroscience |

Course number    401

### In Workflow

1. **99SC Approval**
2. **SC Dean**
3. **SC Curriculum Committee**
4. Undergraduate Curriculum Committee
5. University Senate
6. Provost
7. Course Inventory

### Approval Path

1. 07/17/23 7:28 pm Stuart Burris (stuart.burris): Rollback to Initiator
2. 09/01/23 5:37 pm Stuart Burris (stuart.burris): Approved for 99SC Approval
3. 09/01/23 5:40 pm Stuart Burris (stuart.burris): Approved for SC Dean

| Department | OCSE Interdisciplinary Programs |
| --- | --- |
| College | Science and Engineering |
| Course title | |
| Cellular and Molecular Neuroscience | |
| Abbreviated course title | CELL & MOLECULAR NEUROSCIENCE |

Course description
This course explores the major principles and techniques of cellular and molecular neuroscience. Topics include excitable cells and membranes, ion channels and receptors, synaptic transmission, cell-type determination, axon guidance, neuronal cell biology, synapse formation and neural plasticity. growth factors in signaling, development and regeneration, neuronal stem cells, and sensory signal transduction.

Credit hours          3

Repeatable
  Yes
    Number of repeats      2
    For maximum credits            3

Default grade type      Standard Letter          Alternate grade type(s)

Is this course intended to span more than one term?

  No

Schedule type
  Lecture

CIP Code          261501 - Neuroscience.

Does this course have prerequisites

  Yes

Prerequisites

| And/Or | ( | Course/Test Code | Min Grade/Score | Academic Level | ) | Concurrency? |
| --- | --- | --- | --- | --- | --- | --- |
| | ( | BIOL 120 | C | UG | | No |
| And | | BIOL 121 | C | UG | | No |
| And | ( | BIOL 335 | C | UG | | No |
| Or | | PSYS 360 | C | UG | ) | No |

Corequisites

Equivalent Courses

## Restrictions:

----------------------------------------------------------------------------------------

College restriction?     Yes

Select:
  Include

College:

| College |
| --- |
| Science and Engineering |

Field of study          No
restriction/major?

Classification          No
restriction?

Departmental
Restrictions


Reason for
developing the
proposed course
  This course will be one of the core courses for the new Neuroscience major that is being proposed. It will go
  more in depth into molecular/cellular processes of neurons and glial cells than is covered in introductory
  neuroscience courses such as PSYS 160 (Introduction to Biopsychology) or BIOL 335 (Neurobiology).


Is this related to
other courses at
WKU?
  No

What departments/programs have been consulted concerning potential impact (e.g. to possible duplication or conflict,
changed corequisite or prerequisite for equivalent courses, etc.)? Please provide names and dates for individuals
consulted.


  Gordon Baylis, Lance Hahn, Matthew Shake, Department of Psychological Science, 8/15/2023
  Michael Smith, Hilary Katz, Noah Ashley, Department of Biology, 8/15/2023
  Kevin Williams, Department of Chemistry, 8/15/2023
  Qi Li, Department of Computer Science, 8/15/2023

How many sections
of this course per
academic year will
be offered?
  1

How many students
per section are
expected to enroll in
this proposed
course?
   25

How many students
per academic year
are expected to
enroll?
   25

How were these
projections
calculated? Explain
any supporting
evidence/data you
have for arriving at
these projections:
   A rough estimate of initial enrollments in the new major, based on the trajectory of a similar major
   that was launched at NKU.

Is this course part of          No
a program that leads
to teacher
certificate?

Are you seeking               No
Colonnade approval
for this course?

Student Learning
Outcomes

| # | Student Learning Outcomes |
|---|---------------------------|
| 1 | Describe cellular and molecular neuroscience concepts and principles |
| 2 | Appreciate the different levels of neural organization, from molecules (e.g., neurotransmitters) to the brain |
| 3 | Explain the importance of the scientific method to understanding neuroscience |
| 4 | Effectively communicate recent neuroscience research and ideas |

Content outline

| # | Topic |
|---|-------|
| 1 | Week Lecture Reading<br>1. Tuesday Cells of the nervous system Chapter 1<br>1. Thursday Subcellular organization Chapter 2 |

| # | Topic |
|---|-------|
| | 2. Tuesday Energy metabolism in brain Chapter 3<br>2. Thursday Intracellular signaling Chapter 4<br><br>3. Tuesday Neuronal gene expression Chapter 5<br>3. Thursday Modeling signaling pathways Chapter 6<br><br>4. Tuesday Synaptic transmission Chapter 7<br>4. Thursday Non-classical signaling Chapter 8<br><br>5. Tuesday Gap junctions Chapter 9<br>5. Thursday Exam 1<br><br>6. Tuesday Neurotransmitter receptors Chapter 10<br>6. Thursday Properties of ion channels Chapter 11<br><br>7. Tuesday Membrane & action potentials Chapter 12<br>7. Thursday Biophysics of channels Chapter 13<br><br>8. Tuesday Properties excitable membranes Chapter 14<br>8. Thursday Release of neurotransmitters Chapter 15<br><br>9. Tuesday Exam 2<br>9. Thursday Synaptic integration Chapter 16<br><br>10. Tuesday Processing in dendrites Chapter 17<br>10. Thursday Synaptic plasticity Chapter 18<br><br>11. Tuesday Neural networks Chapter 19<br>11. Thursday Learning and memory Chapter 20<br><br>12. Tuesday Axon guidance Readings<br>12. Thursday Exam 3<br><br>13. Tuesday Development of nervous system Readings<br>13. Thursday Stem cells/Neural regeneration Readings<br><br>14. Tuesday Neurological disease- Part I Chapter 21<br>14. Thursday Neurological disease- Part II Chapter 21<br><br>Comprehensive Final Exam |

Student
expectations and
requirements

Students are expected to bring their laptops to class and participate via Blackboard assignments, case studies, and quizzes. Students will be assigned to groups and present an oral presentation over a recent cellular/molecular neuroscience paper. The course will have three smaller exams and one final exam.

Tentative texts and
course materials

"From Molecules to Networks: An Introduction to Cellular and Molecular Neuroscience (3rd ed.)" John H. Byrne, Ruth Heidelberger, M. Neal Waxham (2014).

Additional readings from the current literature.

Special equipment,
materials, or library
resources needed
None.

Additional
information

Supporting
documentation
NEUR301 Syllabus.docx
NEUR301 Schedule table.docx

Reviewer Comments

**Stuart Burris (stuart.burris) (07/17/23 7:28 pm):** Rollback: Rolled back at request of initiator

Key: 9711

# Course Change Request

## New Course Proposal

Date Submitted: 09/01/23 5:17 pm

Viewing: **NEUR 402 : Systems Neuroscience**

Last revision: 09/01/23 5:17 pm

Changes proposed by: str18637

Programs
referencing this
course
    : Neuroscience

## Approval Path

1. 09/01/23 5:37 pm Stuart Burris (stuart.burris): Approved for 99SC Approval
2. 09/01/23 5:40 pm Stuart Burris (stuart.burris): Approved for SC Dean

Proposed Action

Active

Contact(s)

| Name | E-mail | Phone |
|---|---|---|
| Hilary Katz | hilary.katz@wku.edu | 270-745-3697 |

| | |
|---|---|
| Term for implementation | Fall 2024 |
| Academic Level | Undergraduate |
| Course prefix (subject area) | NEUR - Neuroscience |
| Department | OCSE Interdisciplinary Programs |
| College | Science and Engineering |
| Course title | |

Course number: 402

Systems Neuroscience

Abbreviated course        SYSTEMS NEUROSCIENCE
title

Course description
The goal of this course is to explore how single cells contribute to neural networks and how those neural networks ultimately drive behavior. This course will compare neural systems across the animal kingdom with a particular focus on anatomy and physiology of sensory and motor systems.

Credit hours                3

Repeatable
Yes
Number of repeats        2

For maximum credits                        3


Default grade type        Standard Letter            Alternate grade type(s)


Is this course intended to span more than one term?


No

Schedule type
Lecture

CIP Code                    261501 - Neuroscience.

Does this course have prerequisites


Yes


Prerequisites

| And/Or | ( | Course/Test Code | Min Grade/Score | Academic Level | ) | Concurrency? |
|---|---|---|---|---|---|---|
|  |  | BIOL 335 | C | UG |  | No |
| Or |  | PSYS 360 | C | UG |  | No |


Corequisites

Equivalent Courses

## Restrictions:
----------------------------------------------------------------------------------------------------

College restriction?        Yes

Select:

Include

College:

| College |
|---------|
| Science and Engineering |

Field of study
restriction/major?        No

Classification            No
restriction?

Departmental
Restrictions


Reason for
developing the
proposed course

The new major in Neuroscience needs courses that expand beyond fundamental neuroscience that is currently
offered. This course will give students the opportunity to explore the diversity and complexity of neural systems
across organisms.


Is this related to
other courses at
WKU?
No

What departments/programs have been consulted concerning potential impact (e.g. to possible duplication or conflict,
changed corequisite or prerequisite for equivalent courses, etc.)? Please provide names and dates for individuals
consulted.


Biology, Chemistry, Psychological Science, Computer Science

How many sections
of this course per
academic year will
be offered?
1

How many students
per section are
expected to enroll in
this proposed
course?
25

How many students
per academic year
are expected to
enroll?

25

How were these
projections
calculated? Explain
any supporting
evidence/data you
have for arriving at
these projections:
    Rough estimate of enrollments for the new major


Is this course part of        No
a program that leads
to teacher
certificate?

Are you seeking           No
Colonnade approval
for this course?

Student Learning
Outcomes

| # | Student Learning Outcomes |
|---|---|
| 1 | Describe the relationships between single neurons, circuits and behavior. |
| 2 | Explain evolutionary relationships between neural circuits across organisms. |
| 3 | Write a novel research proposal inspired by course topics. |

Content outline

| # | Topic |
|---|---|
| 1 | Neurons: diversity and function |
| 2 | Synapses |
| 3 | Evolutionary History of Nervous Systems |
| 4 | Comparative Neuroanatomy |
| 5 | "Simple" Circuits: Central Pattern Generators |
| 6 | Motor systems |
| 7 | Sensory systems |
| 8 | Vision: Archerfish Visual Search |
| 9 | Auditory: Barn Owl hunting |
| 10 | Sensorimotor integration |

| # | Topic |
|---|-------|
| 11 | Escape behavior |
| 12 | Plasticity |
| 13 | Resilience and Redundancy |
| 14 | Response to Injury |

Student
expectations and
requirements
   Attend lectures and engage in group discussions on primary literature. Complete assigned reading and
   homework exercises in a timely manner.

Tentative texts and
course materials
   The course will rely heavily on primary literature.

Special equipment,
materials, or library
resources needed
   none

Additional
information


Supporting
documentation
   NEUR 401 Syllabus.docx

Reviewer Comments

Key: 9712

# Course Change Request

## New Course Proposal

Date Submitted: 09/01/23 5:21 pm

## Viewing: **NEUR 498 : Neuroscience Seminar 2**

### Last revision: 09/01/23 5:21 pm

Changes proposed by: str18637

Programs
referencing this
course

: Neuroscience

Proposed Action

Active

Contact(s)

| Name | E-mail | Phone |
|------|--------|-------|
| Lance Hahn | Lance.Hahn@wku.edu | 2707453918 |

| | |
|---|---|
| Term for implementation | Fall 2024 |
| Academic Level | Undergraduate |
| Course prefix (subject area) | NEUR - Neuroscience |
| Department | OCSE Interdisciplinary Programs |
| College | Science and Engineering |
| Course title | |

Course number: 498

### In Workflow
1. **99SC Approval**
2. **SC Dean**
3. **SC Curriculum Committee**
4. Undergraduate Curriculum Committee
5. University Senate
6. Provost
7. Course Inventory

### Approval Path
1. 09/01/23 5:37 pm Stuart Burris (stuart.burris): Approved for 99SC Approval
2. 09/01/23 5:40 pm Stuart Burris (stuart.burris): Approved for SC Dean

Neuroscience Seminar 2

Abbreviated course          NEUROSCIENCE SEMINAR 2
title

Course description
Developing skills for reading, understanding and presenting scientific information within the neuroscience
discipline. Students will read, discuss, summarize and present neuroscience research.

Credit hours               1

Repeatable
Yes
Number of repeats        2

For maximum credits                2

Default grade type        Standard Letter          Alternate grade type(s)

Is this course intended to span more than one term?

No

Schedule type
Seminar

CIP Code                  261501 - Neuroscience.

Does this course have prerequisites

No

Corequisites

Equivalent Courses

## Restrictions:

College restriction?       Yes

Select:
Include

College:

| College |
| --- |
| Science and Engineering |

Field of study            Yes
restriction/major?

Select:
Include

Major:

| Field of stud/major restriction |
|---|
| 747 - Psychological Science |
| 617 - Biology |

Classification restriction?     No

Departmental Restrictions

Major Restriction: Neuroscience majors only (currently not an option on the dropdowns above)

Reason for developing the proposed course

Introduction to Neuroscience scientific research

Is this related to other courses at WKU?

No

What departments/programs have been consulted concerning potential impact (e.g. to possible duplication or conflict, changed corequisite or prerequisite for equivalent courses, etc.)? Please provide names and dates for individuals consulted.

Psychology and Biology departments
July 2023
BIOL: Michael Smith, Hilary Katz
PSYS: Lance Hahn, Gordon Baylis

How many sections of this course per academic year will be offered?

2

How many students per section are expected to enroll in this proposed course?

25

How many students per academic year are expected to enroll?

25

How were these
projections
calculated? Explain
any supporting
evidence/data you
have for arriving at
these projections:

A rough estimate of initial enrollments in the new major, based on the trajectory of a similar major
that was launched at NKU.

Is this course part of        No
a program that leads
to teacher
certificate?

Are you seeking        No
Colonnade approval
for this course?

Student Learning
Outcomes

| # | Student Learning Outcomes |
|---|---|
| 1 | Describe the structure and summary content of a neuroscience research article |
| 2 | Apply critical thinking to the design of neuroscience research questions |
| 3 | Lead discussions of neuroscience research |
| 4 | Critically debate questions about neuroscience research |

Content outline

| # | Topic |
|---|---|
| 1 | How to read a research article |
| 2 | Reading and reviewing a range of neuroscience research |
| 3 | Lead discussion(s) of research articles |

Student
expectations and
requirements

Students will actively participate in discussions led by peers.
Students will lead a discussion of research.
Students will improve their understanding of Neuroscience

Tentative texts and
course materials

Course materials will consist of assigned research articles to read and discuss

Special equipment,
materials, or library
resources needed
  None

Additional
information


Supporting
documentation
  [Syllabus NEUR 375 SAMPLE.pdf](Syllabus NEUR 375 SAMPLE.pdf)

Reviewer Comments

Key: 9713

# Program Change Request

## New Program Proposal

Date Submitted: 09/03/23 6:15 pm

## Viewing: : **Neuroscience**

### Last edit: 09/03/23 6:15 pm

Changes proposed by: str18637

Proposed Action

Active

Contact Person

| Name | Email | Phone |
|---|---|---|
| Gordon Baylis | gordon.baylis@wku.edu | 2707924225 |

| | |
|---|---|
| Term of Implementation | 2024-2025 |
| Academic Level | Undergraduate |
| Program Type | Major |
| Degree Types | Bachelor of Science |
| Department | OCSE Interdisciplinary Programs |
| College | Science and Engineering |

| Was your Notification of Intent (submitted to CPE by the Provost's Office) approved? | No |
| --- | --- |
| Program Name (eg. Biology) | Neuroscience |
| Will this program have concentrations? | Yes |
| Concentrations | Systems<br>Behavioral<br>Computational |
| CIP Code | 26.1501 - Neuroscience. |
| Will this program lead to teacher certification? | No |
| Does the proposed program contain 25% or more new content not previously taught in another course at WKU? If yes, contact the Office of the Provost for additional SACSCOC proposal requirements | |
| | No |

# Catalog Content

Program Overview (Catalog field: Overview tab)

The subject of neuroscience - the science of nervous system and brain structure and function - is a rapidly-growing science that has become established within many different scientific disciplines.  The Neuroscience Major begins with a rigorous core of basic science classes and laboratories, moving on to a core of more advanced classes. All students are educated in the breadth of the subject, but will eventually choose one of three concentrations - systems, behavioral, or computational. These three concentrations represent natural pipelines to postgraduate degrees in medicine, scientific research, and work in artificial intelligence respectively, although all of the three concentrations provide excellent training preparatory for many other fields. As a strong natural science degree with a large "hands-on" component, the Neuroscience Major educates students to be lifelong innovators and problem-solvers.

Curriculum Requirements (Catalog field: Program Requirements)

The Neuroscience Major begins with a rigorous core of basic science classes and laboratories, moving on to a core of more advanced classes.  All students are educated in the breadth of the subject, but will eventually choose one of three concentrations - systems, behavioral, or computational.

| Core Courses | | |
| --- | --- | --- |
| BIOL 120<br>& BIOL 121 | Biological Concepts: Cells Metabolism and Genetics<br>and Biological Concepts: Cells, Metabolism, and Genetics Lab | 4 |

| | | |
|---|---|---|
| Take 3 of these 4 | | 11-13 |
| BIOL 122<br>& BIOL 123 | Biological Concepts: Evolution, Diversity, and Ecology<br>and Biological Concepts: Evolution, Diversity, and Ecology Lab | |
| CHEM 120<br>& CHEM 121 | College Chemistry I<br>and College Chemistry I Laboratory | |
| PSYS 160<br>& PSYS 161 | Introduction to Biopsychology<br>and Introduction to Biopsychology Laboratory | |
| CS 170 | Problem Solving and Programming | |
| or PSYS 415 | Programming for Social Sciences | |
| MATH 183 | Introductory Statistics | 3 |
| or BIOL 382 | Introductory Biostatistics | |
| or PSYS 313 | Statistics in Psychology | |
| PSYS 210<br>& PSYS 211 | Research Methods in Psychology<br>and Research Methods in Psychology Laboratory | 4 |
| NEUR 175 | Course NEUR 175 Not Found | 1 |
| NEUR 300 | Course NEUR 300 Not Found | 3 |
| NEUR 310 | Course NEUR 310 Not Found | 3 |
| NEUR 401 | Course NEUR 401 Not Found | 3 |
| NEUR 402 | Course NEUR 402 Not Found | 3 |
| NEUR 498 | Course NEUR 498 Not Found | 2 |
| BIOL 399 | Research Problems in Biology | 1 |
| or CHEM 399 | Research Problems in Chemistry | |
| or PSYS 490 | Independent Study in Psychological Sciences | |
| Total Hours | | 38-40 |

## Systems Concentration (67-70 hours)

| | | |
|---|---|---|
| Core Courses | | 38-40 |
| BIOL 224<br>& BIOL 225 | Animal Biology and Diversity<br>and Animal Biology and Diversity Lab | 4 |
| BIOL 319 | Introduction to Molecular and Cell Biology | 3 |
| BIOL 330 | Animal Physiology | 3 |
| BIOL 464 | Endocrinology | 3 |
| CHEM 222<br>& CHEM 223 | College Chemistry II<br>and College Chemistry II Laboratory | 5 |
| CHEM 340<br>& CHEM 341 | Organic Chemistry I<br>and Organic Chemistry Laboratory I | 5 |

| PSYS 360 & PSYS 365 | Behavioral Neuroscience and Laboratory in Behavioral Neuroscience | 3-4 |
|---|---|---|
| or BIOL 335 | Neurobiology | |
| PSYS 465 | Psychopharmacology | 3 |
| Total Hours | | 67-70 |

**Behavioral Concentration (64-66 hours)**

| Core Courses | | 38-40 |
|---|---|---|
| BIOL 224 & BIOL 225 | Animal Biology and Diversity and Animal Biology and Diversity Lab | 4 |
| PSYS 331 | Principles of Human and Animal Learning | 3 |
| or BIOL 334 | Animal Behavior | |
| PSYS 333 | Cognitive Psychology | 3 |
| PSYS 360 & PSYS 365 | Behavioral Neuroscience and Laboratory in Behavioral Neuroscience | 4 |
| PSYS 363 | Sensory and Perceptual Systems | 3 |
| PSYS 440 | Abnormal Psychology | 3 |
| PSYS 462 | Fundamentals of Cognitive Neuroscience | 3 |
| PSYS 465 | Psychopharmacology | 3 |
| Total Hours | | 64-66 |

**Computational Concentration (64-66 hours)**

| Core Courses | | 38-40 |
|---|---|---|
| CS 180 | Computer Science I | 4 |
| CS 290 | Computer Science II | 4 |
| CS 331 | Data Structures | 3 |
| CS 339 | Discrete Structures | 3 |
| CS 456 | Artificial Intelligence | 3 |
| MATH 307 | Introduction to Linear Algebra | 3 |
| PSYS 360 | Behavioral Neuroscience | 3 |
| or BIOL 335 | Neurobiology | |
| PSYS 333 | Cognitive Psychology | 3 |
| Total Hours | | 64-66 |

Required Support Course for Computational Concentration (4 hours)

| MATH 136 | Calculus I | 4 |
|---|---|---|
| Total Hours | | 4 |

4-Year Plan
## Systems Concentration

First Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| BIOL 120 | 3 | BIOL 122 | 3 |
| BIOL 121 | 1 | BIOL 123 | 1 |
| ENG 100 | 3 | CHEM 120 | 3 |
| MATH 116 | 3 | CHEM 121 | 2 |
| NEUR 175 | 1 | COMM 145 | 3 |
| PSYS 160 | 3 | COLONNADE F-SB | 3 |
| PSYS 161 | 1 | | |
| | 15 | | 15 |

Second Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| MATH 183 | 3 | ENG 200 | 3 |
| CHEM 222 | 3 | NEUR 310 | 3 |
| CHEM 223 | 2 | BIOL 224 | 3 |
| PSYS 210 | 3 | BIOL 225 | 1 |
| PSYS 211 | 1 | BIOL 319 | 3 |
| COLONNADE E-AH | 3 | COLONNADE E-SB | 3 |
| | 15 | | 16 |

Third Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| BIOL 330 | 3 | NEUR 300 | 3 |
| CHEM 340 | 3 | NEUR 402 | 3 |
| CHEM 341 | 2 | COLONNADE K-SY | 3 |
| NEUR 401 | 3 | ELECTIVE | 3 |
| NEUR 498 | | ELECTIVE | 3 |
| COLONNADE K-LG | 3 | | |
| | 14 | | 15 |

Fourth Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| BIOL 335 | 3 | INDEPENDENT STUDY | 1 |
| BIOL 464 | 3 | ELECTIVE | 3 |
| NEUR 498 | 1 | ELECTIVE | 3 |
| PSYS 465 | 3 | ELECTIVE | 3 |
| COLONNADE K-SC | 3 | ELECTIVE | 3 |
| ELECTIVE | 3 | ELECTIVE | 1 |
| | 16 | | 14 |

Total Hours 120

## Behavioral Concentration

First Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| BIOL 120 | 3 | BIOL 122 | 3 |
| BIOL 121 | 1 | BIOL 123 | 1 |
| ENG 100 | 3 | CHEM 120 | 3 |
| MATH 116 | 3 | CHEM 121 | 2 |

## First Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| NEUR 175 | 1 | PSYS 100 | 3 |
| PSYS 160 | 3 | COLONNADE F-SB | 3 |
| PSYS 161 | 1 | | |
| | 15 | | 15 |

## Second Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| BIOL 224 | 3 | COMM 145 | 3 |
| BIOL 225 | 1 | NEUR 310 | 3 |
| ENG 200 | 3 | PSYS 313 | 3 |
| PSYS 210 | 3 | PSYS 333 | 3 |
| PSYS 211 | 1 | COLONNADE E-SB | 3 |
| COLONNADE E-AH | 3 | | |
| | 14 | | 15 |

## Third Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| NEUR 401 | 3 | NEUR 300 | 3 |
| NEUR 498 | 1 | NEUR 402 | 3 |
| PSYS 331 | 3 | PSYS 363 | 3 |
| PSYS 440 | 3 | COLONNADE K-SY | 3 |
| COLONNADE K-LG | 3 | ELECTIVE | 3 |
| ELECTIVE | 3 | | |
| | 16 | | 15 |

## Fourth Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| NEUR 498 | 1 | INDEPENDENT STUDY | 1 |
| PSYS 360 | 3 | PSYS 462 | 3 |
| PSYS 365 | 1 | ELECTIVE | 3 |
| PSYS 465 | 3 | ELECTIVE | 3 |
| COLONNADE K-SC | 3 | ELECTIVE | 3 |
| ELECTIVE | 3 | ELECTIVE | 3 |
| | 14 | | 16 |

Total Hours 120

**Computational Concentration**

## First Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|
| BIOL 120 | 3 | BIOL 122 | 3 |
| BIOL 121 | 1 | BIOL 123 | 1 |
| ENG 100 | 3 | COMM 145 | 3 |
| MATH 116 | 3 | MATH 117 | 3 |
| PSYS 160 | 3 | COLONNADE F-SB | 3 |
| PSYS 161 | 1 | | |
| NEUR 175 | 1 | | |
| | 15 | | 13 |

## Second Year

| Fall | Hours | Spring | Hours |
|------|-------|--------|-------|

### First Year

| Fall | Hours | Spring | Hours |
|---|---|---|---|
| CS 180 | 4 | CS 290 | 4 |
| MATH 136 | 4 | ENG 200 | 3 |
| PSYS 210 | 3 | MATH 307 | 3 |
| PSYS 211 | 1 | NEUR 310 | |
| COLONNADE E-AH | 3 | PSYS 313 | 3 |
| | | PSYS 415 | 3 |
| | 15 | | 16 |

### Third Year

| Fall | Hours | Spring | Hours |
|---|---|---|---|
| CS 331 | 3 | CS 339 | 3 |
| NEUR 401 | 3 | NEUR 300 | 3 |
| NEUR 498 | 1 | NEUR 402 | 3 |
| PSYS 360 | 3 | COLONNADE E-SB | 3 |
| COLONNADE K-LG | 3 | COLONNADE K-SY | 3 |
| ELECTIVE | 3 | | |
| | 16 | | 15 |

### Fourth Year

| Fall | Hours | Spring | Hours |
|---|---|---|---|
| NEUR 498 | 1 | PSYS 333 | 3 |
| CS 456 | 3 | INDEPENDENT STUDY | 1 |
| ELECTIVE | 3 | ELECTIVE | 3 |
| ELECTIVE | 3 | ELECTIVE | 3 |
| ELECTIVE | 3 | ELECTIVE | 3 |
| ELECTIVE | 3 | ELECTIVE | 1 |
| | 16 | | 14 |

Total Hours 120

Will this program be managed or owned by more than one department?

Yes

Interdisciplinary Departments

| Secondary Departments |
|---|
| Biology (BIOL) |
| Chemistry (CHEM) |
| Computer Science (CS) |
| Psychological Sciences (PSYS) |

Does this program include courses from outside your department?

No

# Relation to Mission and Strategic Plan

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

The Neuroscience major speaks directly and primarily to "Our Students" and their "Preparation for the Global Stage" in Climbing to Greater Heights.
Neuroscience is a rapidly-growing field that does not have a traditional 'home" department, but spans Biology, Chemistry, Psychological Science, and increasingly, Computer Science. WKU has a broad range of faculty with strong research and teaching expertise spread among these four departments. Indeed, many of the classes with the neuroscience major have been taught for many years in these departments. So, the key innovation in proposing this major is to bring together this large expertise into one interdepartmental space at a time when the science of the brain is developing worldwide at an unprecedented pace. The faculty of the different departments have thought carefully about governance, and have crafted a college-level program that is both strong, yet flexible - able to adapt to scientific change.

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

The Neuroscience major addresses the KY Postsecondary Education Strategic Agenda 2022-30 in the areas of Talent and Value. The new major will offer a new opportunities for greater talent development among KY students and those from surrounding states while leveraging existing faculty talent for the launch phase. Neuroscience is a rapidly growing field, and having a Neuroscience major at WKU should improve the options for career outcomes of more WKU graduates. The research expectation of all Neuroscience majors will also contribute to increasing research to support strong KY communities and economies.

The utilization of existing faculty talent also addresses the value proposition of the new major. For at leas the initial phase of implementation (two years) the program will draw on largely existing capacities in the four contributing academic units to offer the coursework and support research opportunities for the students.

## Program Quality and Demand

Provide justification and evidence to support the need and demand for this proposed program. Include any data on student demand; career opportunities at the regional, state, and national level; and any changes or trends in the discipline that necessitate a new program.

Please insert one Learning Outcome per box. Click green plus sign for additional LO boxes

Learning Outcomes
and Measurement
Plan

|  | **List all student learning outcomes of the program.** | **Measurement Plan** |
| --- | --- | --- |
| SLO 1 | Develop a working knowledge of the main content domains in neuroscience. | Assess student learning within neuroscience foundation, including content connected to cellular and molecular biology, behavioral neuroscience, neuroscience techniques and research methods, and neurological systems. |

| | **List all student learning outcomes of the program.** | **Measurement Plan** |
|---|---|---|
| | | Student performance on objective items will be assessed. |
| SLO 2 | Explain the scientific method of discovery, based on testing hypotheses by collecting and analyzing data in appropriately-designed experiments. | Each academic year, a representative sample of the exam questions in PSYS 210, and NEUR 310 will be used to examine the extent to which students embrace the scientific method. |
| SLO 3 | Propose, design, and run experiments, and analyze the data from these experiments. | This will first be tested at an elementary level by examining a random sample of student lab reports from the multiple introductory level lab classes that all students take. At an intermediate level this will be assessed by examining the reports of a sample of students in the methods (PSYS 210) and statistics classes. At the most advanced level this will be assessed by a sample of the work output from independent study classes. |
| SLO 4 | Communicate the scientific method, and be able to explain scientific findings to experts and to lay audiences. | This will be assessed by examining a sample of student work in NEUR 300 - Writing in Neuroscience. It will also be assessed more informally - but more rigorously - by assessing the presentations of work given by students in NEUR 498. |
| SLO 5 | Embrace problem-solving, and truly own a problem such that they can solve problems. | This will first be tested at an elementary level by examining a random sample of student lab reports from the multiple introductory level lab classes that all students take. At an intermediate level this will be assessed by examining the reports of a sample of students in the methods (PSYS210) and statistics classes. At the most advanced level this will be assessed by a sample of the work output from independent study classes and work presented in NEUR 498. |

*Assessment Template: [https://www.wku.edu/academicaffairs/ee/assurance_learning_resources.php](https://www.wku.edu/academicaffairs/ee/assurance_learning_resources.php)*

Upload Assessment Plan      [Neuro new_program_asl_template.docx](Neuro new_program_asl_template.docx)

Change in Discipline (If the program is being proposed to meet changes in the academic discipline, please outline those changes and explain why they necessitate development of a new program.)
  N/A

Specify any distinctive qualities of the program.

There are a number of prima facie similar programs in Neuroscience in The Commonwealth of Kentucky; however, closer examination shows that the proposed program at WKU is unique, distinct, and serves as a pathway to opportunity for the less advantaged, often first generation students that we serve so well.

Western Kentucky University. We have strong administrative support for attracting faculty with expertise in neuroscience research. The successful hiring of WKU's first choices in two searches for faculty members in neuroscience (one in Biology and one in Psychological Sciences) was due, in large part, to the strong neuroscience milieu of WKU (as stated by our new colleagues). We have a storied history as a pathway to opportunity for many of the most under-privileged members of our state. The National Science Foundation has repeatedly cited our success in producing baccalaureate graduates who go on to success in Ph.D. programs at research universities. A large part of the reason for developing the Neuroscience Major is to augment this role. First, this generates rounded scientists who can be valuable problem-solvers for industry. Second, this program tracks graduates into medicine, and A.I. - two of the most well-paying, and expanding careers in the Commonwealth. We provide a unique and invaluable pathway to success through this program.

University of Kentucky and University of Louisville. These are strong and rigorous programs, taught by faculty with strong research bona fides. However, for students of our region, and the demographic that we serve, they are less accessible.

Transylvania University. Again, this is a strong program with good faculty. But with a total price tag around $50,000 per year, this is out of reach for most of the students that WKU serves.

Bellarmine University. A reasonably good program for which the $50,000 per year price tag again renders it beyond the reach of our demographic.

Morehead University. This program can best be described as aspirational, lacking the critical mass of neuroscience-focused faculty (all from the Psychology Department) really needed to provide a well-rounded neuroscience program.

Northern Kentucky University. This program is also in its infancy and presents a more balanced cadre of contributing faculty than our other sister institution. It is difficult to judge the stage of development and particular expertise this program has or will have, as data available from Gray Associates through Spring 2020 showed fewer than 10 graduates total.

Does the proposed program differ from existing programs in terms of curriculum, focus, objectives, etc.?

No

Does the proposed program serve a different student population (i.e., students in a different geographic area, non-traditional students) from existing programs?

No

Is access to existing        No
programs limited?

Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which students transfer has been explored and coordinated with other institutions.

The majority of the program consists of courses that are regularly offered at WKU and other state institutions. As such, there are already transfer equivalencies established for most of these courses. A thorough analysis of the neuroscience program at UK was undertaken and all of the core courses have or will have reasonably direct transfer equivalencies. Additionally, approximately half of the upper division electives have or will have direct equivalencies.

Describe student demand data for this program.

The evidence demonstrates consistent, strong, and growing academic demand to sustain a Neuroscience major. Over the last few years, we have launched a Neuroscience Minor, as well as a Neuroscience Track in the Psychological Sciences B.S. These continue to grow, and the vast majority of students within these programs have stated that they would far rather be majoring in Neuroscience.

This major is an excellent preparation for application to Medical School, and one of the tracks has been specifically designed to cover all of the key classes required by the majority of US Medical Schools. Indeed, the inaugural director of the Neuroscience B.S. (Dr. Baylis) serves as Pre-Medical advisor for the Psychological Sciences Department. All but one of his advisees has said that they wished that a Neuroscience Major would have been available to them.

The Major also appeals to students who seek a career in Artificial Intelligence. AI is a computational approach that is inspired by, and borrows from, neuroscience. The mundane students interested in A.I. will see it as a branch of Computer Science and will likely be successful in using established algorithms. The star students, however, understand that many new approaches await discovery, and the most productive source for inspiration will be Neuroscience. Therefore, the students taking our Computation track are destined to become the true innovators in A.I.

Describe workforce needs and career outcomes for graduates of this program.

At the most general level, it is known that degrees in the natural sciences lead to higher paying jobs than other fields. The Neuroscience BS program is a rigorous science degree that is centered on learning hands-on techniques of problem solving, data analysis, and communication of findings. As such, Neuroscience represents a paradigmatic natural science degree.

But the Neuroscience degree will be even more valuable than typical natural science degrees. Everyone agrees that, with an aging population, the health sciences will continue to be growth areas for well-paying jobs. At the same time, it is clear that Artificial Intelligence (AI) - for better or for worse - will be a growing field for the foreseeable future. AI is an approach to computational problem-solving that borrows from the design of the human brain and cognition.

So, a rigorous Neuroscience BS program prepares students for well-paying jobs in two of the most solid, expanding areas - Medicine and AI. Given that we have very strong faculty in terms of teaching and research across the breadth of Neuroscience (spread across Biology, Psychological Sciences, Chemistry, Computer Science, and Mathematics) we can be sure that the program we are crafting will be world class, and excellent preparation for a variety of needed and well-paid careers.

Gray Associates show that this program faces very modest competition (15th percentile) within the state and region, as well as high demand from students (97th percentile), and extremely high employability (89th percentile). It is almost impossible to imagine a major that is more valuable to the Commonwealth.

Will this program replace or enhance any existing program(s) or concentration(s) within an existing program?

No

Program Demand Data and Support Documents

CIP 26-1501 Neuroscience Regional Scorecard for Bachelors.pdf

## Delivery Mode

Is 25% or more of this program offered at a location other than main campus?

No

Enter Location(s)
and Percentage of
Program Offered at
Location(s)

| Location | Percentage |
|---|---|
| Bowling Green | 100 |

Is 50% or more of this program offered by distance education (online asynchronous, online synchronous, connected classrooms, etc.)?

No

Do you plan to offer 100% of this program online?

No

If no, enter the percentage of the program that will be taught online.

0

Do you plan to offer 100% of this program face-to-face?

Yes

Do you plan to offer at least 25% of this program as a direct assessment competency-based educational program?

No

*See the SACSCOC Policy on Direct Assessment Competency-based Educational Programs.*
*https://www.sacscoc.org/pdf/081705/DirectAssessmentCompetencyBased.pdf*

# Library Resources

Attach library
resources

Neuro Library Resources.docx

Rationale for the program proposal?

The subject of Neuroscience - the science of nervous system and brain structure and function - is a rapidly-growing science that has become established within many different scientific disciplines. In keeping with the prominence of this interdisciplinary subject, we propose a major spanning four main science departments within Ogden College of Science and Engineering at WKU. This program will offer new opportunities for students and stands to attract additional students who would not otherwise attend WKU.

CPE Proposal        WKU_CPE_Proposal_Neuroscience-BS DRAFT on 2023-09-04.docx

Additional
Attachments

Additional information or attachments

Reviewer Comments

Key: 375