# Curriculum Proposal

## PHYS 19-20 #17

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### Course Modification

- 1.2 PHYS 2101 Physics I (5 credits) to PHYS 2101 Physics I (4 credits); description change

**Liberal Education Goal Area 3**

- 1.5 PHYS 2102 Physics II (5 credits) to PHYS 2102 Physics II (4 credits); description change

**Liberal Education Goal Area 3**

### Program Modification

- 1.10 Physics minor

### Signatures
BSU Curriculum Forms

Form 1

Curriculum Modification Summary

College: Business, Mathematics & Science
Department: Physics
Proposer: Ryan Sayer
Proposer’s position: Assistant Professor of Physics
Describe the modifications you propose, and how they will work to students' advantage:

We are reducing the credit hours of the PHYS 2101 and 2102 courses from 5 to 4. As of right now, PHYS 2101 and PHYS 2102 are the only courses in the Lib Ed Goal Area 3 that is more than 4 credit hours. This reduction in credit hours should increase enrollment and help us grow our physics program at BSU. We will move some of the content normally taught in these courses to PHYS 3103. The course descriptions have been modified to reflect the change in topics covered.

Modifications proposed (specify number of each):
__2__Course Modification(s) (form 2)
_____New Course(s) (form 3)
_____Course Drop(s) (form 4)
_____Program Modification(s) (form 5)
_____New Program(s) (form 6)
_____Program Drop(s) (form 7)
The modifications affect (check):
__x__Liberal Education
__x__Undergraduate Curriculum
_____Graduate Curriculum
__x__Teacher Licensure Program(s)
BSU Curriculum Forms  
Form 2  
Updated 9.19.15

Course Modification Form

Current Course Number(s):
  Undergraduate: **PHYS 2101**  
  Graduate:  
Proposed Course Number(s), if different:
  Undergraduate:  
  Graduate:  

Current Course Title: **Physics I**  
Proposed Course Title, if different:

Current Course Description:
First course of a calculus-based introductory physics sequence, with laboratory. Topics include Newton’s laws of motion, gravitation, fluids, vibrations and waves, sound, and ideal gases. Prerequisite: MATH 2471 or consent of instructor. Liberal Education Goal Area 3 (LC).

Proposed Course Description, if different:
First course of a calculus-based introductory physics sequence, with laboratory. Topics include Newton’s laws of motion, gravitation, fluids, vibrations and waves. Prerequisite: MATH 2471 or consent of instructor. Liberal Education Goal Area 3 (LC).

Current Credits: **5**  
Proposed Credits, if different: **4**

Current Prerequisite(s):
  Undergraduate: **MATH 2471 or consent of instructor**  
  Graduate:  
Proposed Prerequisite(s), if different:
  Undergraduate:  
  Graduate:  

1) Reason(s) for change(s):
We are reducing the credit hours of the course from 5 to 4. As of right now, PHYS 2101 and PHYS 2102 are the only courses in the Lib Ed Goal Area 3 that is more than 4 credit hours. This reduction in credit hours should increase enrollment and help us grow our physics program at BSU. We will move some of the content normally taught in this course to PHYS 3103. The course description has been modified to reflect the change in topics covered.

2) May this modified course replace the current course for students remaining in the old curriculum? Yes ___X__ No _____
3) Do these modifications change any of the following? **For all Yes answers, please provide updated information on the next page.**

- Student Learning Outcomes: Yes _____  No __X__
- Major Content Areas: Yes _____  No __X__
- Projected Maximum Class Size (Cap): Yes _____  No __X__

4) Current Course fee(s) per student: $0
   Proposed Course fee(s) per student, if different: Same

5) Service Areas:
   This course is a requirement or an elective in the programs/areas listed below.
   Non-licensure programs:
   - Aquatic Biology, B.S. major Aquatic Systems emphasis (select 1–no change to major credits)
   - Aquatic Biology, B.S. major Fisheries emphasis (select 1–no change to major credits)
   - Aquatic Biology, B.S. major Wetlands emphasis (select 1–no change to major credits)
   - Biochemistry, Cellular and Molecular Biology, B.S. major Cellular and Molecular emphasis (select 1 group – no change to major credits)
   - Biochemistry, Cellular and Molecular Biology, B.S. major Biochemistry emphasis (select 1 group – no change to major credits)
   - Biology, B.S. major (select 1 group – no change to major credits)
   - Biology, B.S. major Cellular and Molecular emphasis (select 1 group – no change to major credits)
   - Biology, B.S. major Medical Sciences emphasis (select 1 group – no change to major credits)
   - Wildlife Biology, B.S. (select 1 – no change to major credits)
   - Medical Laboratory Science, B.S. (4+1 Option) (select 1 – no change to major credits)
   - Chemistry, B.S. major Criminalistics emphasis (select 1 – no change to major credits)
   - Chemistry, B.S. major Biochemistry/Biotechnology emphasis (required course, will reduce major by 1 credit)
   - Chemistry, B.S. major Environmental Chemistry emphasis (required course, will reduce major by 1 credit)
   - Chemistry, B.S. major Chemistry emphasis (required course, will reduce major by 1 credit)
   - Environmental Studies, B.S. major Geohydrology Emphasis (select 1–no change to major credits)
   - Environmental Studies, B.S. major Ecosystems Emphasis (select 1-no change to major credits)
   - Exercise Science, B.S. major Fitness and Leadership Promotion emphasis (select 1-no change to major credits)
   - Exercise Science, B.S. major Medical Fitness emphasis (select 1-no change to major credits)
   - Physics, minor (required course, will reduce minor by 1 credit form 5 attached) –
Teacher Licensure programs:
Science Education, B.S. Physics Specialty (required but as an “or” so no change to major credits)

Liberal Education:
Goal Area 3

The above “service area” programs/departments were notified of this modification on 9/18/19 & 11/14/19 by email.

Please check one of the items below:
_____ No comments were received from other programs or departments within one week of the notification.
___X___ Comments were received within one week of the notification, and are attached.
BSU Curriculum Forms

Form 2
Updated 9.19.15

Course Modification Form

Current Course Number(s):
  Undergraduate: PHYS 2102
  Graduate:
Proposed Course Number(s), if different:
  Undergraduate:
  Graduate:

Current Course Title: Physics II
Proposed Course Title, if different:

Current Course Description:
Continuation of a calculus-based introductory physics sequence, with laboratory. Topics include heat and thermodynamics, electricity, magnetism, electrical circuits, light, and optics. Prerequisite: PHYS 2101, MATH 2471. Pre/Co-requisite MATH 2472 or consent of instructor. Liberal Education Goal Area 3 (LC).

Proposed Course Description, if different:
Continuation of a calculus-based introductory physics sequence, with laboratory. Topics include gases, heat and thermodynamics, electricity, magnetism, and electrical circuits. Prerequisite: PHYS 2101, MATH 2471. Pre/Co-requisite MATH 2472 or consent of instructor. Liberal Education Goal Area 3 (LC).

Current Credits: 5
Proposed Credits, if different: 4

Current Prerequisite(s):
  Undergraduate: PHYS 2101, MATH 2471. Pre/Co-requisite MATH 2472 or consent of instructor.
  Graduate:
Proposed Prerequisite(s), if different:
  Undergraduate:
  Graduate:

1) Reason(s) for change(s):

We are reducing the credit hours of the course from 5 to 4. As of right now, PHYS 2101 and PHYS 2102 are the only courses in the Lib Ed Goal Area 3 that are more than 4 credit hours. This reduction in credit hours should increase enrollment and help us to grow our physics program. The list of topics in the description has been modified to reflect the change in the covered topics that will be required by this credit reduction.
2) May this modified course replace the current course for students remaining in the old curriculum? Yes ___X__ No _____

3) Do these modifications change any of the following? **For all Yes answers, please provide updated information on the next page.**

   - Student Learning Outcomes: Yes _____ No __X__
   - Major Content Areas: Yes _____ No __X__
   - Projected Maximum Class Size (Cap): Yes _____ No __X__

4) Current Course fee(s) per student: $0
   Proposed Course fee(s) per student, if different: Same

5) Service Areas:
   Non-licensure programs:
   - Biochemistry, Cellular and Molecular Biology, B.S. major Cellular and Molecular emphasis (select 1 group – will not change credits in major)
   - Biochemistry, Cellular and Molecular Biology, B.S. Biochemistry emphasis (select 1 group – will not change credits in major)
   - Biology, B.S. major Medical Sciences emphasis (select 1 group – will not change credits in major)
   - Biology, B.S. major (select 1 group – will not change credits in major)
   - Biology, B.S. major Cellular and Molecular emphasis (select 1 group – will not change credits in major)
   - Medical Laboratory Science, B.S. (4+1 Option) (required course but is an or option and the other course is 4 credits so will not change credits in major)
   - Chemistry, B.S. major Chemistry emphasis (required course so would reduce credits in major by 1)
   - Environmental Studies, B.S. major Ecosystem Studies Emphasis (select 2 – will not change credits in the major)
   - Exercise Science, B.S. major Fitness and Leadership Promotion emphasis (select 2 – will not change credits in major)
   - Exercise Science, B.S. major Medical Fitness emphasis (select 2 – will not change credits in major)
   - Physics, minor (reduces by 1 credit; form 5 included)

   Teacher Licensure programs:
   - Science Education, B.S. major Physics specialty (required course but is an or option and the other course is 4 credits so will not change credits in major)

   Liberal Education:
   - Goal Area 3

   The above “service area” programs/departments were notified of this modification on **9/18/19 and 11/14/19 by email.**
Please check one of the items below:

______  No comments were received from other programs or departments within one week of the notification.

___X___  Comments were received within one week of the notification, and are attached.

From: Marek, Keith A <KMarek@bemidjistate.edu>
Sent: Thursday, November 14, 2019 11:07 AM
To: Sayer, Ryan T <Ryan.Sayer@bemidjistate.edu>
Cc: Gullickson, Robin S <Robin.Gullickson@bemidjistate.edu>
Subject: RE: 17.PHYS_19-20 (modifications to credits for PHYS 2101/2102)

Ryan,

Yes the reduction of the majors by one credit is fine with us. Robin, do we need to submit curriculum reflecting this, or is this just automatically taken care of?

KAM

From: Sayer, Ryan T <Ryan.Sayer@bemidjistate.edu>
Sent: Thursday, November 14, 2019 10:09 AM
To: Marek, Keith A <KMarek@bemidjistate.edu>
Cc: Gullickson, Robin S <Robin.Gullickson@bemidjistate.edu>
Subject: FW: 17.PHYS_19-20 (modifications to credits for PHYS 2101/2102)

Hi Keith,

I was asked to confirm that the chemistry department is aware that by reducing the credits of PHYS 2101 and PHYS 2102 from 5 to 4 credits it will reduce the total number of credits for a few of the chemistry programs. Is that okay with your department?

--Ryan

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From: Sayer, Ryan T <Ryan.Sayer@bemidjistate.edu>
Sent: Wednesday, September 18, 2019 2:51 PM
Subject: Proposed curriculum change for PHYS 2101 and PHYS 2102

Hi,
The physics department has decided to reduce the credit hours of the calculus-based introductory physics courses, PHYS 2101 (Physics 1) and PHYS 2102 (Physics 2), from 5 credits to 4 credits each. This move is designed to improve enrollment and build our physics program, but it will require that we adjust some of the content in those courses and move some content into our modern physics course, PHYS 3103. Since these courses are included as part of one or more of your department’s major programs, we wanted to contact you and see if you have any feedback for us on this move. Here are two possible options:

1. We could move the unit on ideal gases and kinetic gas theory from PHYS 2101 to PHYS 3101 (modern physics) and also move the unit on thermodynamics and heat engines from PHYS 2102 to PHYS 3103.

2. We could move the unit covering ideal gases and kinetic gas theory to PHYS 2102 and then move the units on ray optics and wave optics from PHYS 2102 to PHYS 3103.

Please let us know if you prefer one of these two options or if you have another suggestions. Also, let us know if there is any material in particular that you would prefer to remain in the PHYS 2101 course and not move to a later course. If I don’t hear back from you then I will assume that either change is okay for your department. Thanks!

Best,
Ryan Sayer

From: Marek, Keith A <KMarek@bemidjistate.edu>
Sent: Wednesday, September 18, 2019 6:57 PM
To: Sayer, Ryan T <Ryan.Sayer@bemidjistate.edu>
Subject: FW: Proposed curriculum change for PHYS 2101 and PHYS 2102

Ryan,

Here’s some input from Bob, which I concur with. P-Chem is probably the subject that will be affected the most by this proposal.

KAM

From: Quandt, Bob W <Bob.Quandt@bemidjistate.edu>
Sent: Wednesday, September 18, 2019 6:52 PM
To: Marek, Keith A <KMarek@bemidjistate.edu>
Subject: RE: Proposed curriculum change for PHYS 2101 and PHYS 2102

Keith,

The best option is number 1. I already teach ideal gas law and thermo (but not optics) in 4711. Having them move those subjects to PHYS 3101 will minimize redundancy.

Bob

From: Marek, Keith A <KMarek@bemidjistate.edu>
Sent: Wednesday, September 18, 2019 4:03 PM
To: Quandt, Bob W <Bob.Quandt@bemidjistate.edu>
Subject: FW: Proposed curriculum change for PHYS 2101 and PHYS 2102

Bob,

See below from physics…We require 2101/2 for the ACS degree, and not necessarily modern…would either of these options have a better effect on what is covered in P-Chem?

KAM

From: Isaacson, Carl W <Carl.Isaacson@bemidjistate.edu>
Sent: Thursday, September 19, 2019 8:46 AM
To: Sayer, Ryan T <Ryan.Sayer@bemidjistate.edu>
Subject: RE: Proposed curriculum change for PHYS 2101 and PHYS 2102

Ryan,

The Center for Sustainability Studies supports Physics making changes to your program with the goal of growing your enrollment. We see positives and negatives to each of proposed changes and option 2 makes more sense for our program, but option 1 would not be objectionable.

Carl
BSU Curriculum Forms

Form 5

Program Modification Form

Program to be modified: Physics minor

List all proposed change(s): Reduction in minor credits from 30 credits to 28 due to the course modifications included in this proposal.

Reason(s) for the change(s): We are reducing the credit hours of the PHYS 2101 and 2102 courses from 5 to 4. This reduction in credit hours should increase enrollment and help us grow our physics program at BSU.

Note: In order to avoid hidden prerequisites, if a course is being dropped from this program (but not from the entire curriculum), please check for which remaining courses may include this dropped course as a prerequisite. Course prerequisites may be found in the online catalog (http://www.bemidjistate.edu/academics/catalog/). Remedies for hidden prerequisites may be found under Curriculum Forms at (http://www.bemidjistate.edu/faculty_staff/faculty_association/forms/).

Note: If a course from another department/program was either added to or dropped from this program, please notify the chair/coordinator of that course's department/program and indicate the following:
The course’s home department/program was notified of the addition or dropping of their course(s) on ________ (date) by ________________ (mail, email, or phone).

N/A

Please check one of the items below:

______ No comments were received from other programs or departments within one week of the notification.

______ Comments were received within one week of the notification, and are attached.

Note: If this is a joint program, the signatures of both department chairs (and both deans, if different colleges) must be provided.

Alert: Attach a copy of the current program showing the marked changes. Please copy the current program from the online catalog (http://www.bemidjistate.edu/academics/catalog/) and paste it into Word. Then use either the Track Changes feature under Tools, or the underline and strikethrough Font feature under Format. (Please note that the
Track Changes feature may be easily switched on and off by holding down the Ctrl+Shift+E keys.)

Physics minor

Required Credits: 30 28
Required GPA: 2.00

I REQUIRED COURSES

I REQUIRED COURSES

COMPLETE THE FOLLOWING COURSES:

- MATH 2471 Calculus I (5 credits)
- MATH 2472 Calculus II (5 credits)
- PHYS 2101 Physics I (5 credits)
- PHYS 2102 Physics II (5 credits)
- PHYS 3103 Physics III (4 credits)

II REQUIRED ELECTIVES

SELECT 6 SEMESTER CREDITS FROM PHYSICS COURSES

OR COMPLETE THE FOLLOWING COURSES:

(SOME COURSES IN THIS SECTION REQUIRE PREREQUISITES THAT ARE NOT PART OF THIS PROGRAM)

- CHEM 4711 Physical Chemistry I (3 credits)
- CHEM 4712 Physical Chemistry II (3 credits)
- ANY PHYSICS COURSE NUMBERED 3150 OR ABOVE
BSU Curriculum Forms

Form 8
Updated: 09.18.15

Signatures

Ryan Sayer / Assistant Professor of Physics / 9.26.19
Proposer / Title / Date

John Truedson / Physics / 9.26.19
Chair or Director / Department or Program / Date
Note: "All departmental recommendations [on curriculum] must be reviewed and approved by the department's faculty."--IFO/MnSCU Master Agreement 2009-2011, 20.A.3 (p. 80).

At this point, packet goes to Records Office/Curriculum Coordinator to be logged in to the Curriculum Proposal Progress Grid.

Marilyn D Yoder / Business, Mathematics and Sciences / 9.27.19
Dean / College / Date

Note: If proposal is sent back to the Proposer, please notify the Curriculum Coordinator. If approved, packet goes to Academic Affairs Office.