REQUEST TO COLLEGE CURRICULUM COMMITTEE FOR CURRICULAR IMPROVEMENTS

DEPARTMENT: Physics **PROPOSED EFFECTIVE SEMESTER:** F2014 **COLLEGE:** **Arts & Sciences**

PROPOSED IMPROVEMENTS

Academic Program
- ☐ New degree*
- ☐ New major*
- ☐ New curriculum*
- ☐ New concentration*
- ☐ New certificate
- ☐ New minor
- ☐ Revised major
- ☐ Revised minor
- ☐ Admission requirements
- ☐ Graduation requirements
- ☐ Deletion ☐ Transfer
- ☒ Other (explain**)

Substantive Course Changes
- ☐ New course
- ☐ Pre or Co-requisites
- ☐ Deletion (required by others)
- ☐ Course #, different level
- ☐ Credit hours
- ☐ Enrollment restriction
- ☐ Course-level restriction
- ☐ Prefix ☐ Title and description (attach current & proposed)
- ☐ General education (select one) Not Applicable
- ☐ Other (explain**)

Misc. Course Changes
- ☐ Title
- ☐ Description (attach current & proposed)
- ☐ Deletion (not required by others)
- ☐ Course #, same level
- ☐ Variable credit
- ☐ Credit/no credit
- ☐ Cross-listing
- ☐ COGE reapproval
- ☐ Other (explain**)

** **Other:** Change the description of the physics major in the course catalog.

Title of degree, curriculum, major, minor, concentration, or certificate: Physics Major

Existing course prefix and #: **Proposed course prefix and #:** **Credit hours:**

Existing course title:

Proposed course title:

Existing course prerequisite & co-requisite(s):
Proposed course prerequisite(s)
If there are multiple prerequisites, connect with "and" or "or". To remove prerequisites, enter "none."
Proposed course co-requisite(s)
If there are multiple corequisites, they are always joined by "and."
Proposed course prerequisite(s) that can also be taken concurrently:
Is there a minimum grade for the prerequisites or corequisites?
The default grades are D for undergraduates and C for graduates.
Major/minor or classification restrictions:
List the Banner 4 character codes and whether they should be included or excluded.
For 5000 level prerequisites & corequisites: Do these apply to: (circle one) undergraduates graduates both

Specifications for University Schedule of Classes:
a. Course title (maximum of 30 spaces):
b. Multi-topic course: ☐ No ☐ Yes
c. Repeatable for credit: ☐ No ☐ Yes
d. Mandatory credit/no credit: ☐ No ☐ Yes
e. Type of class and contact hours per week (check type and indicate hours as appropriate)
1. ☐ Lecture
2. ☐ Lab or discussion
3. ☐ Lecture/lab/discussion
4. ☐ Seminar or ☐ studio
5. ☐ Independent study
6. ☐ Supervision or practicum

CIP Code (Registrar's use only):

Chair/Director Kirk T. Korista Date 8/12/13

Chair, College Curriculum Committee Date

Dean Date: Graduate Dean: Date

Curriculum Manager: Return to dean ☐ Date Forward to: Date

Chair, COGE/ PEB / FS President Date

FOR PROPOSALS REQUIRING GSC/USC REVIEW:

* ☐ Approve ☐ Disapprove	Chair, GSC/USC	Date
* ☐ Approve ☐ Disapprove	Provost	Date

Revised May 2007. All previous forms are obsolete and should not be used.

CAS14-14

1. Explain briefly and clearly the proposed improvement.

   The required courses for our LEC Physics Major already qualify the students for a math minor. We would like to change the catalog language to make this explicit.

2. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)

   This would ensure that our students receive the credit they deserve for having completed a minor in math.

3. Effect on other colleges, departments or programs. If consultation with others is required, attach evidence of consultation and support. If objections have been raised, document the resolution. Demonstrate that the program you propose is not a duplication of an existing one.

   None.

4. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.

   It could make our major more attractive to students if they realize they will automatically complete a math minor as part of the physics major. It can also make our majors more marketable to prospective employers and graduate programs.

5. Effects on enrolled students: Are program conflicts avoided? Will your proposal make it easier or harder for students to meet graduation requirements? Can students complete the program in a reasonable time? Show that you have considered scheduling needs and demands on students' time. If a required course will be offered during summer only, provide a rationale.

   The change will help to ensure the students get full credit for the completion of a math minor.

6. Student or external market demand. What is your anticipated student audience? What evidence of student or market demand or need exists? What is the estimated enrollment? What other factors make your proposal beneficial to students?

   See above.

7. Effects on resources. Explain how your proposal would affect department and University resources, including faculty, equipment, space, technology, and library holdings. Tell how you will staff additions to the program. If more advising will be needed, how will you provide for it? How often will course(s) be offered? What will be the initial one-time costs and the ongoing base-funding costs for the proposed program? (Attach additional pages, as necessary.)

   None.

8. General education criteria. For a general education course, indicate how this course will meet the criteria for the area or proficiency. (See the General Education Policy for descriptions of each area and proficiency and the criteria. Attach additional pages as necessary. Attach a syllabus if (a) proposing a new course, (b) requesting certification for baccalaureate-level writing, or (c) requesting reapproval of an existing course.) Not applicable.

9. List the learning outcomes for the proposed course or the revised or proposed major, minor, or concentration. These are the outcomes that the department will use for future assessments of the course or program. Not applicable.

10. Describe how this curriculum change is a response to assessment outcomes that are part of a departmental or college assessment plan or informal assessment activities. Not applicable.

11. (Undergraduate proposals only) Describe, in detail, how this curriculum change affects transfer articulation for Michigan community colleges. For course changes, include detail on necessary changes to transfer articulation from Michigan community college courses. For new majors or minors, describe transfer guidelines to be developed with Michigan community colleges. For revisions to majors or minors, describe necessary revisions to Michigan community college guidelines. Department chairs should seek assistance from college advising directors or from the admissions office in completing this section. None.

Current Catalog Language:

Physics Major

Return to: Departments and Programs

Required Courses

- PHYS 2050 - University Physics I **Credits:** 4 hours
- PHYS 2060 - University Physics I Laboratory **Credits:** 1 hour
- PHYS 2070 - University Physics II **Credits:** 4 hours
- PHYS 2080 - University Physics II Laboratory **Credits:** 1 hour
- PHYS 3090 - Introductory Modern Physics **Credits:** 4 hours
- PHYS 3100 - Introductory Modern Physics Lab **Credits:** 1 hour
- PHYS 3300 - Thermodynamics **Credits:** 3 hours
- PHYS 3420 - Electronics **Credits:** 4 hours
- PHYS 3520 - Waves and Optics **Credits:** 3 hours
- PHYS 4200 - Analytical Mechanics **Credits:** 3 hours
- PHYS 4400 - Electromagnetism **Credits:** 4 hours
- PHYS 4600 - Quantum Mechanics **Credits:** 3 hours
- PHYS 4660 - Advanced Laboratory **Credits:** 3 hours

Required Cognates

- CHEM 1100 - General Chemistry I **Credits:** 3 hours
- and
- CHEM 1110 - General Chemistry Laboratory I **Credits:** 1 hour
- CHEM 1120 - General Chemistry II **Credits:** 3 hours
- and
- CHEM 1130 - General Chemistry Laboratory II **Credits:** 1 hour
- MATH 2720 - Multivariate Calculus and Matrix Algebra **Credits:** 4 hours
- MATH 3740 - Differential Equations and Linear Algebra **Credits:** 4 hours
- MATH 5720 - Vector Calculus and Complex Variables **Credits:** 4 hours

Select Either

- MATH 1220 - Calculus I **Credits:** 4 hours
- or
- MATH 1700 - Calculus I, Science and Engineering **Credits:** 4 hours
- (Recommended)

Select Either

- MATH 1230 - Calculus II **Credits:** 4 hours
- or
- MATH 1710 - Calculus II, Science and Engineering **Credits:** 4 hours
- (Recommended)

Computer Programming Requirement

The Department requires Physics majors to be proficient in a computer programming language before graduation.
This requirement can be met by demonstrating proficiency or by passing the following course with a grade of "C" or higher.

- CS 1110 - Computer Science I **Credits:** 4 hours

Note: Higher level courses such as CS 2100 (Script Programming in Python) can be substituted with permission of the undergraduate advisor. Further programming experience is encouraged.

Baccalaureate-Level Writing Requirement

Students who have chosen the Physics Major will satisfy the Baccalaureate-Level Writing Requirement by successfully completing:

- PHYS 4660 - Advanced Laboratory **Credits:** 3 hours

Return to: Departments and Programs

Proposed Catalog Language

Physics Major

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- CHEM 1130 - General Chemistry Laboratory II **Credits:** 1 hour

Required Math Minor

Select Either

- MATH 1220 - Calculus I **Credits:** 4 hours
- or
- MATH 1700 - Calculus I, Science and Engineering **Credits:** 4 hours
- (Recommended)

And Either

- MATH 1230 - Calculus II **Credits:** 4 hours
- or
- MATH 1710 - Calculus II, Science and Engineering **Credits:** 4 hours
- (Recommended)

And

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