

PHYS 105: MATHEMATICAL METHODS IN PHYSICS

In Workflow

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Approval Path

1. Tue, 01 Sep 2020 18:03:18 GMT
Jerome Buerki (jerome.buerki): Approved for PHYS Committee Chair
2. Tue, 01 Sep 2020 18:09:48 GMT
Chris Taylor (ctaylor): Approved for PHYS Chair
3. Wed, 02 Sep 2020 22:53:20 GMT
Thomas Krabacher (tsk): Rollback to PHYS Chair for NSM College Committee Chair
4. Wed, 16 Sep 2020 05:35:57 GMT
Chris Taylor (ctaylor): Approved for PHYS Chair
5. Wed, 16 Sep 2020 23:32:39 GMT
Thomas Krabacher (tsk): Approved for NSM College Committee Chair
6. Thu, 17 Sep 2020 00:21:51 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean

Date Submitted: Tue, 21 Jul 2020 19:29:58 GMT

Viewing: PHYS 105 : Mathematical Methods in Physics

Last edit: Wed, 16 Sep 2020 05:35:38 GMT

Changes proposed by: Matt Block (217368646)

Contact(s):

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Catalog Title:

Mathematical Methods in Physics

Class Schedule Title:

Math Methods In Physics

Academic Group: (College)

NSM - Natural Sciences & Mathematics

Academic Organization: (Department)

Physics and Astronomy

Will this course be offered through the College of Continuing Education (CCE)?

No

Catalog Year Effective:

Spring 2021 (2021/2022 Catalog)

Subject Area: (prefix)

PHYS - Physics

Catalog Number: (course number)

105

Course ID: (For administrative use only.)

158356

Units:

3

In what term(s) will this course typically be offered?

Fall term only

Does this course require a room for its final exam?

Yes, final exam requires a room

Does this course replace an existing experimental course?

No

This course complies with the credit hour policy:

Yes

Justification for course proposal:

Course changes:

- We are formally including MATH 45 as a prerequisite, since the material in PHYS 105 relies on differential equations. Students were already advised to take MATH 45 before PHYS 105, so this just formalizes what has been common practice. Note that MATH 45 was already required for courses that follow PHYS 105, so this does not add a new requirement to the degree.
- We are moving PHYS 105 to the fall semester to allow our majors to take the classes for which PHYS 105 is a prerequisite starting in the following spring semester, thus streamlining their progress to degree.
- We are updating the out-of-date course description to accurately reflect the material covered in the class.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)

Linear algebra, linear vector spaces, linear transformations, the eigenvalue problem, Sturm-Liouville Theory. Solving PDEs common to physical systems. Fourier transforms, Dirac delta function, differential and integral vector calculus with a focus on applications to problems in physics, such as classical mechanics, thermodynamics, quantum mechanics, and electromagnetism.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Does this course require safety training?

No

Does this course require personal protective equipment (PPE)?

No

Does this course have prerequisites?

Yes

Prerequisite:

MATH 32; MATH 45; PHYS 11A, PHYS 11B, PHYS 11C or PHYS 5A, PHYS 5B.

Prerequisites Enforced at Registration?

Yes

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Discussion

Discussion Classification

CS#04 - Lecture /Recitation (K-factor=1 WTU per unit)

Discussion Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes: Describe outcomes using the following format: 'Students will be able to: 1), 2), etc.'

Students will be able to:

- 1) Identify the properties that define a linear vector space,
- 2) Classify second-order, linear, ordinary differential equations,
- 3) Analyze partial differential equations and assess if they are well-posed,
- 4) Solve well-posed partial differential equations using separation of variables,
- 5) Solve ordinary differential equations using the method of Frobenius,
- 6) Utilize Fourier transforms and the Dirac delta function when appropriate

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above.

Typical formative assessments include regular homework assignments (LO 1-6) and typical summative assessments include 2-3 Midterm examinations (LO 1-6) and a Final examination (LO 1-6).

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

No

Identify the program(s) in which this course is required:

Programs:
BA in Physics
BA in Physics (Teacher Preparation)
BS in Physics
BS in Physics (Applied Physics)

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Competence in the disciplines

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

No

Please attach any additional files not requested above:

syllabus_105.pdf

Reviewer Comments:

Thomas Krabacher (tsk) (Wed, 02 Sep 2020 22:53:20 GMT): Rollback: 1. Proposal should reference it's application to Physics; currently looks like just another Math course. Also, attach syllabus to proposal.

Chris Taylor (ctaylor) (Thu, 03 Sep 2020 02:58:29 GMT): Need to rework course description.

Key: 3900