TO: UNDERGRADUATE CURRICULUM COMMITTEE
FROM: DAVID FLEMING, PROGRAM CHAIR, AEROSPACE ENGR
THROUGH: MARK ARCHAMBAULT, ASST. DEAN, CoES
SUBJECT: PROPOSED CHANGES AEE 3241 – AERODYNAMICS & FLIGHT MECHANICS
DATE: NOVEMBER 25, 2019

The Department of Aerospace, Physics, and Space Sciences proposes making the following prerequisite changes to AEE 3241 – Aerodynamics & Flight Mechanics:

- Add AEE 3162 – Compressible Flow as a prerequisite
- Remove AEE 3161 – Fluid Mechanics as a prerequisite

AEE 3162 is already a co-requisite. It is acceptable for students to have taken this course prior to enrollment in AEE 3241, and adding AEE 3162 as a prerequisite will help streamline enrollment into the course.

AEE 3161 is a prerequisite to AEE 3162, and thus is a redundant prerequisite to AEE 3241.
REQUEST TO CHANGE THE REQUIREMENTS FOR A COURSE

Any change, addition or removal of any restriction, or change in credit hours or availability for a course requires this form, accompanied by any supporting documentation, be completed and approved as indicated below.

COLLEGE: Engineering and Science
DEPARTMENT: APSS

REQUEST IS FOR CHANGE IN COURSE:

AEE 3162
Prefix Number
Aerodynamics & Flight Mechanics
Course Title

TO BE INCLUDED IN 20 20 21 CATALOG
Course changes are effective beginning with the fall term in which they appear in the University Catalog.

IS REQUEST FOR A CHANGE IN THE NAME LISTED ABOVE? □ Yes □ No If yes, requested name ____________________________

IS REQUEST FOR A CHANGE IN CREDITS FOR COURSE LISTED ABOVE? □ Yes □ No If yes, current credits __________ requested credits __________

IS REQUEST TO CHANGE RESTRICTIONS FOR COURSE LISTED ABOVE? □ Yes □ No If yes, please check all that apply:

□ Add □ Remove □ Prerequisite □ Corequisite □ AEE 3162
Prefix Number
□ and □ or

□ Add □ Remove □ Prerequisite □ Corequisite □ AEE 3161
Prefix Number
□ and □ or

□ Add □ Remove □ Other Restrictions* □ Yes □ No If yes, please use box below:

*Other restrictions may include changing the grade mode (P/F, S/U, A-F, CEU), deactivating a course already in the system, majors or class levels restricted from registration, or other restrictions.

Please enter the complete prerequisite/restriction list as it should appear if this change is approved:

Pre/Co-Requisite String should read: Prerequisite: AEE 3162 OR Co-requisite: AEE 3162
(Note that AEE 3162 is already listed as a co-requisite)

□ Yes □ No Is this request for the course to be used to measure program-level student learning outcomes?

□ Yes □ No Is this request for the course to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.

□ Yes □ No Will this change impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program that is impacted.

APPROVALS: Once appropriate department approvals are completed, submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

1) (1/25/19)

2) (1/25/19)

3) (1/26/19)

Chair, Graduate Council
Date

OR

Chair, Undergraduate Curriculum Committee
Date

CATALOG & CURRICULUM MANAGER’S USE ONLY

SCACRISE _____________ SCADETL _____________ SCAPREQ _____________

SCABASE ________________ SCARRES _____________ ACALOG _____________ Operator Initials _____________ Date _____________

DISTRIBUTION
Original – Catalog & Curriculum Manager
Copy – Academic Unit

Florida Institute of Technology • Office of Registrar
150 West University Boulevard, Melbourne, FL 32901-6975 • 321-674-8114 • Fax 321-674-7827
To: Dr. Mark Archambault, Chair, Undergraduate Curriculum Committee, Associate Dean for Academics, College of Engineering and Science

Through: Dr. Daniel Batcheldor, Head, Department of Aerospace, Physics & Space Sciences

Through: Dr. Marco Carvalho, Dean, College of Engineering and Science

From: Dr. Csaba Palotai, Program Chair, Physics & Space Sciences

Date: December 2, 2019

Re: Changing prerequisites for PHY 4020 “Optics”

The Department of Aerospace, Physics and Space Sciences requests a change in requirements for the existing course PHY 4020 “Optics”. In recent semesters students who signed up for this class without sufficient background, in particular without the completion of PHY 3440 “Electromagnetic Theory”, have struggled to do well. To ensure student success and to increase on-time graduation rate, we propose to add PHY 3440 as pre-requisite for the “Optics” course. Since that class has PHY 2002 as a prerequisite, we request removing PHY 2002 from the current Prerequisite list.

In support of the request we include the following documents:

- “Request to Change the Requirements for a Course” form

Please let me know if there is anything else that we can provide to help implement this change for the University Catalog.

Respectfully submitted,

Csaba Palotai
REQUEST TO CHANGE THE REQUIREMENTS FOR A COURSE

Any change, addition or removal of any restriction, or change in credit hours or availability for a course requires this form, accompanied by any supporting documentation, be completed and approved as indicated below.

COLLEGE: College of Engineering and Science

DEPARTMENT: Aerospace, Physics & Space Sciences

REQUEST IS FOR CHANGE IN COURSE: PHYS 4020 Optics

TO BE INCLUDED IN 2020/2021 CATALOG

Course changes are effective beginning with the fall term in which they appear in the University Catalog.

IS REQUEST FOR A CHANGE IN THE NAME LISTED ABOVE? □ Yes □ No If yes, requested name ______________________________________________________________________

IS REQUEST FOR A CHANGE IN CREDITS FOR COURSE LISTED ABOVE? □ Yes □ No If yes, current credits __________________ requested credits __________________

IS REQUEST TO CHANGE RESTRICTIONS FOR COURSE LISTED ABOVE? □ Yes □ No If yes, please check all that apply:

□ Add □ Remove □ Prerequisite □ Corequisite PHYS 3440 □ and □ or PHYS 2002 □ and □ or

□ Add □ Remove □ Other Restrictions* □ Yes □ No If yes, please use box below:

*Other restrictions may include changing the grade mode (P/F, S/U, A-F, CEU), deactivating a course already in the system, majors or class levels restricted from registration, or other restrictions.

Please enter the complete prerequisite/restriction list as it should appear if this change is approved:

Prerequisite: (MTH 2201 or MTH 3200) and PHY 3440

□ Yes □ No Is this request for the course to be used to measure program-level student learning outcomes?

□ Yes □ No Is this request for the course to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.

□ Yes □ No Will this change impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program that is impacted.

APPROVALS: Once appropriate department approvals are completed, submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

1) [Signature] 12/3/2019
   Dean of Associate Dean

2) [Signature] 12/3/2019
   Chair, Department Head/Program Chair

3) [Signature] 12/3/2019
   Chair, Undergraduate Curriculum Committee

CATALOG & CURRICULUM MANAGER’S USE ONLY

SCACRESSE SCADETL SCAPREQ

SCABASE SCARRES Atgl LOG OPERATOR INITIALS DATE

DISTRIBUTION

Original – Catalog & Curriculum Manager
Copy – Academic Unit

Florida Institute of Technology • Office of Registrar

150 West University Boulevard, Melbourne, FL 32901-6975 • 321-674-8114 • Fax 321 674-7827

RGR-410-519
To:       Dr. Mark Archambault, Chair, Undergraduate Curriculum Committee, Associate Dean for Academics, College of Engineering and Science
Through:  Dr. Daniel Batchelor, Head, Department of Aerospace, Physics & Space Sciences
Through:  Dr. Marco Carvalho, Dean, College of Engineering and Science
From:     Dr. Csaba Palotai, Program Chair, Physics & Space Sciences
Date:     December 2, 2019
Re:       Adding “Introduction to Nuclear Physics” course to the catalog

The Department of Aerospace, Physics and Space Sciences proposes the addition of a new course, “Introduction to Nuclear Physics”, as elective in the Physics program, to take effect in Fall 2020. The proposed course will add flexibility for elective choices, leveraging existing expertise of the faculty. This course, with the successful completion of the prerequisite course, can also be taken by students from other majors.

In support of the request we include the following documents:

- “Adding a New Course to the Curriculum” form
- Sample Syllabus

Please let me know if there is anything else that we can provide to help implement this change for the University Catalog.

Respectfully submitted,

Csaba Palotai
**FLORIDA TECH**

**ADDING A NEW COURSE TO THE CURRICULUM**

New courses are available beginning with the fall term in which they appear in the University Catalog.

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>COURSE NO.*</th>
<th>CREDIT HOURS</th>
<th>ACADEMIC YEAR TO BE ADDED TO THE FILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>4035</td>
<td>3</td>
<td>Fall 2020 (e.g., Fall 2025)</td>
</tr>
</tbody>
</table>

*Justify level if 1000-level and no co- or prerequisites

<table>
<thead>
<tr>
<th>CLASS HOURS</th>
<th>LECTURE HOURS</th>
<th>LAB HOURS</th>
<th>RESEARCH HOURS</th>
<th>CONTACT HOURS (CEU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45/sem</td>
<td>45/sem</td>
<td>0/sem</td>
<td>0/sem</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEPARTMENT</th>
<th>SCHEDULE TYPE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace, Physics &amp; Space Sciences</td>
<td>Lecture (A)</td>
<td></td>
</tr>
<tr>
<td>(e.g., Ocean Engineering and Marine Sciences)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| COLLEGE OF AERONAUTICS—23                  |               |   |
| COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS—25  |               |   |
| NATHAN M. BISK COLLEGE OF BUSINESS—24      |               |   |

<table>
<thead>
<tr>
<th>COMPUTER TITLE</th>
<th>CATALOG TITLE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro to Nuclear Physics</td>
<td>Restricted to 25 characters, including spaces</td>
<td></td>
</tr>
</tbody>
</table>

This course will be entered into the system as: Bi-Level □ Cross-Listed □ Dual-Numbered □ Full-Load □ None of these □ Standard Listing □

<table>
<thead>
<tr>
<th>CATALOG DESCRIPTION OF COURSE</th>
<th>Restricted to 350 characters, including spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduces key elements of nuclear science and technology. Covers nuclear structure, stability, decay laws, particle interactions, energy deposition, dose rate and measurements. Includes examples from various disciplines. Reviews industrial applications, explosions and accidents, and their effect on the environment.</td>
<td></td>
</tr>
</tbody>
</table>

This description has been approved by the catalog office Emory 12-3-2019

**In addition, please attach a course syllabus and/or more detailed description.**

**RESTRICTIONS**

<table>
<thead>
<tr>
<th>P H Y 2 0 0 3</th>
<th>Course Prefix/Number</th>
<th>Prerequisite ONLY</th>
<th>Corequisite ONLY</th>
<th>BOTH Prerequisite/Corequisite</th>
<th>and</th>
<th>or</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 2 2 0 1</td>
<td>Course Prefix/Number</td>
<td>Prerequisite ONLY</td>
<td>Corequisite ONLY</td>
<td>BOTH Prerequisite/Corequisite</td>
<td>and</td>
<td>or</td>
</tr>
<tr>
<td>MTH 3 2 0 0</td>
<td>Course Prefix/Number</td>
<td>Prerequisite ONLY</td>
<td>Corequisite ONLY</td>
<td>BOTH Prerequisite/Corequisite</td>
<td>and</td>
<td>or</td>
</tr>
</tbody>
</table>

**GRADES TO BE ISSUED**

| A, B, C, D, F | A, B, C, D, F, CEU/Audit | CEU | S, U | P, F | Other |

Please indicate old course information and the date/term the course may be removed from the system:

- Yes □ No □ Will this course be used to measure program-level student learning outcomes? If yes, review and signature required.**
- Yes □ No □ Will this course be used to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.
- Yes □ No □ Will this course impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program impacted.
- Yes □ No □ Will this course be used to satisfy the Cross Cultural (CC) requirement? If yes, attach confirmation memo from QEP2 Committee.

**APPROVALS:** On completion of description and course number verification, affix appropriate signatures as indicated, and submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

![Signature]

12/3/2019

Chair, Graduate Council

12/3/2019

Chair, Undergraduate Curriculum Committee

**CATALOG & CURRICULUM MANAGER**

These changes/additions have been made for the University Catalog and entered into the BAN5NL term named above.

Catalog & Curriculum Manager

**REGISTRAR'S USE ONLY**

SCHARSL SACODE SACR E SCP REQ SCABASE ANALOG
SCARRSC CIP Code 40.0906 Operator Init Date

Florida Institute of Technology • Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6975 • 321-674-8114 • Fax 321-674-7827

RGR-384-219

**DocuSign Envelope ID: 0487645F-34DD-4E49-9A48-0FA1DDE2208C**
PHY 4### - Introduction to Nuclear Physics
Dr. George Rybicki
321-674-8549
Office: OLIN 232
grzybicki@fit.edu

Olin PSS 144

Text: Atoms, Radiation and Radiation Protection- James Turner,
3rd edition Wiley 2007

Course Description: This course introduces the key elements of nuclear science and technology. Beginning with nuclear structure and stability and moving on to decay laws, particle interactions, energy deposition, dose rate and measurements, the concepts are illustrated with practical examples from science, industry and medicine. The final section of the course includes a review of impact of industrial activities, explosions and accidents and their environmental consequences.

Prerequisites: PHY 2003 and MTH2201 or MTH 3200

Syllabus

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Text Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Intro, Atoms, Structure, X-Rays</td>
<td>Chapter 1,2</td>
</tr>
<tr>
<td>Two</td>
<td>Nuclear Structure and Decay</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>Three</td>
<td>Decay, Half life, Activity</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>Four</td>
<td>Interaction of Radiation and Matter e⁻ and α,</td>
<td>Chapter 5,6</td>
</tr>
<tr>
<td>Five</td>
<td>Interaction of Radiation and Matter photons</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>Six</td>
<td>Interaction of Radiation and Matter neutrons</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>Seven</td>
<td>Radiation Detection and Instrumentation</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>Eight</td>
<td>Midterm, Nuclear Statistics</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>Nine</td>
<td>Principles of Radiation Safety, Monitoring, Decon</td>
<td>Chapter 12</td>
</tr>
<tr>
<td>Ten</td>
<td>Biological Effects</td>
<td>Chapter 13</td>
</tr>
<tr>
<td>Eleven</td>
<td>Radiation Protection</td>
<td>Chapter 14</td>
</tr>
<tr>
<td>Twelve</td>
<td>Nuclear Fuel Cycle, Energy &amp; Reactors</td>
<td></td>
</tr>
<tr>
<td>Thirteen</td>
<td>Nuclear Medicine</td>
<td></td>
</tr>
<tr>
<td>Fourteen</td>
<td>Nuclear Accidents</td>
<td></td>
</tr>
<tr>
<td>Fifteen</td>
<td>Nuclear Weapons and Fallout</td>
<td></td>
</tr>
<tr>
<td>Sixteen</td>
<td>Non-Proliferation</td>
<td></td>
</tr>
<tr>
<td>Seventeen</td>
<td>Final EXAM, Paper Due</td>
<td></td>
</tr>
</tbody>
</table>

Course Grade Structure: Midterm Exam #1 25%; Final Exam 30%
Course Paper 30%, Homework 15%
*** Introduction to Nuclear Physics ***

**Class Report (Instructions and Guidelines)**

The class report (a modest-sized research paper) is an integral part of this course. It is intended to familiarize you with contemporary topics and issues in radiation protection and enable you to pursue the approved topic of your choice at some degree of depth. You will select a topic from the recommended list, or else can request that an alternative topic be approval by the instructor.

**Format For the Class Research Paper:**

Length: approximately 8 pages typed, double-spaced) NOT COUNTING Figures, Tables and attached reference materials. 15 pages for grad students)

All class papers will be typed, double-spaced

A minimum of at least 4 journal articles shall be used;

(No INTERNET/WWW sources are acceptable).

**General Content of Your Paper Shall Be As Follows:**

- **Title**

  - **Introduction** (what main issue or point in radiation protection are you discussing)

- **Main Body** (provide technical issues, data, figures, charts...)

- **Conclusion** (what did you learn from this research paper)

  Supporting Materials (appendices and attachments if any)

  //not included in word count//

Please allow time to explore the approved topic you have selected.

Topics Must Be Approved: NOT LATER THAN ######
Name ___________________       PHY 4####/5####

Class Research Paper
(Topic Selection)

Candidate Topics Include:

( ) Nuclear Weapons Proliferation

( ) Radiation Protection Issues Associated With Nuclear Weapon Site Cleanup

( ) Food Irradiation

( ) Loss/Black Market Sale/Illegal Use of Radioisotopes

( ) Fukushima, Chernobyl, Mayak, Tokaimura, Windscale, TMI or other US nuclear accidents

( ) Nuclear Weapons Testing (Worldwide): Radiation Protection Issues

( ) Naval Nuclear Power accidents

( ) Problems and Procedures With Low Level Radioactive Medical Wastes

( ) Nuclear Contamination of the Arctic Regions

( ) Terrorist Threat To Nuclear Facilities

( ) Nuclear Power Industry In ___________(select country): Status and Future

( ) Other ____________________________________________

What particular aspect (with respect to issues in radiation protection) of the above topic are you planning to deal with in your class research paper?

(brief outline and/or several sentences of discussion please)

What references have you obtained or are planning to use?

THIS TOPIC ( ) IS APPROVED _____; ( ) IS NOT APPROVED _____
To: Dr. Mark Archambault, Chair, Undergraduate Curriculum Committee, Associate Dean for Academics, College of Engineering and Science
Through: Dr. Daniel Batcheldor, Head, Department of Aerospace, Physics & Space Sciences

Through: Dr. Marco Carvalho, Dean, College of Engineering and Science

From: Dr. Csaba Palotai, Program Chair, Physics & Space Sciences

Date: December 2, 2019

Re: Changing graduation requirements for Physics minor program

The Department of Aerospace, Physics and Space Sciences requests a change in graduation requirements for the Physics minor program. Recent discussions about minor programs highlighted that the majority of students cannot enroll in the Physics minor program due to 10 overlapping credit hours between their major program and the Physics minor. Since most of these students are from STEM majors, not being able to add the Physics minor may affect them adversely when seeking jobs after graduation. To solve this problem, we request the following changes:

- removal of PHY 2092 “Physics Laboratory 2” from the list of named courses,
- changing the Restricted Electives from 9-11 to 10-12 credit hours.

These changes ensure that all students are eligible to enroll in the Physics minor and they help to maintain the high standards of the program.

In support of the request we include the following documents:

- “Changing Graduation Requirements in a Major/Minor” form

Please let me know if there is anything else that we can provide to help implement this change for the University Catalog.

Respectfully submitted,

Csaba Palotai
CHANGING GRADUATION REQUIREMENTS IN A MAJOR/MINOR

The addition or removal of any graduation requirement in a major or minor requires that this form, accompanied by supporting documentation, be completed and approved as indicated below. Incomplete or incorrect forms will not be processed.

COLLEGE: College of Engineering and Science
DEPARTMENT: Aerospace, Physics & Space Sciences

DEGREE LEVEL: Minor
PROGRAM TITLE: Physics

TO BE INITIATED WITH CATALOG YEAR: 2021

CHANGE REQUESTED FOR □ major program □ minor program

Program changes are effective beginning with the fall term in which they appear in the University Catalog.

□ Yes ☐ No Will this change impact the program’s assessment process? If yes, attach a description of how the assessment will be impacted and the new process.

DESCRIPTION OF REQUESTED CHANGES: Attach a more detailed description and any supporting documentation.

We request:
- removal of PHY 2092 Physics Laboratory 2 from the list of named courses
- changing the Restricted Electives to 10-12 credit hours

A more detailed description is given in the attached Memorandum.

DocuSign Envelope ID: 0497645F-34DD-4E43-9A48-0FA1D2DE2208C

12/3/2019

Chair, Graduate Council

Date

Chair, Undergraduate Curriculum Committee

Date

REGISTRAR’S USE ONLY

CAPP / Degree Evaluation

☐ Yes ☐ No Update completed: [Date] Initials

Catalog Management System

☐ Yes ☐ No Update completed: [Date] Initials

Florida Institute of Technology • Office of Registrar
150 West University Boulevard, Melbourne, FL 32901-6975 • 321-674-8114 • Fax 321-674-7827

PGR-409-518