

Curricular Action Workflow



Missouri State / Computer Services - MIS / Curricular Action Workflow / **CAW - New Program Proposal Form**

New Program Proposal Form

Submitted on 02/13/2022 by Kartik Ghosh (Kartikghosh@missouristate.edu).

This form is to be used for internal Missouri State approval of any proposal for a new program involving two or more courses, including any new graduate program, new undergraduate major (whether comprehensive or non-comprehensive), new option within an existing program (whether graduate or undergraduate), new minor, new certificate, or new certification program.

New graduate programs, new undergraduate majors, and certificate programs involving more than 18 credit hours require approval by the CBHE as well as approval through the Missouri State curricular process. CBHE applications for such programs are processed through the Office of Institutional Research. All proposals for new programs requiring CBHE approval should progress through the Missouri State curricular process accompanied by a draft of the required CBHE documentation.

Department:

Physics, Astronomy, & Mat Sci

Proposed Program Title:

Biomedical Physics Certificate

Choose One:

- | | |
|---|--|
| <input type="radio"/> Non-Comprehensive Undergraduate Major | <input type="radio"/> Option |
| <input type="radio"/> Comprehensive Undergraduate Major | <input type="radio"/> Minor |
| <input type="radio"/> Graduate Program | <input checked="" type="radio"/> Certificate |

(Note: If the option you need is not listed above contact curriculum@missouristate.edu)

Does this program include any new courses?

No Yes (A corresponding new course form must be submitted to create each new course.)

Select Degree Type (or Select Graduate Certificate or Undergraduate Certificate):

UGCT - Undergraduate Certificate

General Education Courses Required:

None

Total Hours: 0

General Education Courses Recommended:

None

Total Hours: 0

Requirements (including Admission) and Limitations for Specific Degree/Program:

Students mainly from science and engineering disciplines are encouraged to enroll this certificate program.

Total Hours: 0

Courses Required in Department:

PHY 124(4) or PHY 204(5), and PHY 373(3)

Total Hours: 7-8

Courses Required in Other Departments:

BIO 121(4) or BMS 110+BMS 111(4), and CHM 342(3) or BMS 599(3),

Total Hours: 7

Prerequisites for Required Courses:

PHY 123 for PHY124; PHY203 and either MTH 280 or MTH 288 for PHY 204; ENG 110 and MTH 135 for BIO 121; ENG 110 and MTH 134 or MTH 136 for BMS 110 and BMS 111; CHM 170 for CHM 342; PHY124 or PHY204 for PHY 373

Recommended Electives in Department:

None

Total Hours: 0

Recommended Electives in Other Departments:

None

Total Hours: 0

Limitations on Electives:

None

Please attach the following documents: (only one file may be attached for each requirement; accepts file types of PDF, DOC or DOCX)

1. Statement of Rationale: *Attached* [View Attachment](#)
2. Estimated costs for first five years: *Attached* [View Attachment](#)
3. Complete catalog description (including new courses and course changes pending approval): *Attached* [View Attachment](#)
4. Complete a new program application for the Missouri Department of Higher Education and Workforce Development (MDHEWD).

(NOTE: New Minors do not require this form. Certificates with 18 hours or less do not require this form. Originators may skip this step entirely for these types of new programs.)

- A. Use the templates to complete an MDHEWD application.

[New Undergraduate Major \(or certificate with more than 18 hours\)](#) | [New Graduate Program \(Master's Specialist, or certificate with more than 18 hours\)](#) For new Doctoral Program contact Associate Provost Julie Masterson for MDHEWD forms and process.

- B. Upload and attach the completed MDHEWD application. *Not Attached*

* Contact Associate Provost Julie Masterson for assistance completing MDHEWD forms.

** The Office of Institutional Research (IR) will submit these application forms to the state after the new program has been fully approved through the curricular process.

What is the date that this new program was approved by departmental or program faculty? (MM/DD/YYYY)

11/08/2021

Current Status:

College Council Review

Proposal Progress:

02/14/2022 - Submitted by Department Head (Robert Mayanovic)

Review Comments:

No comments have been added to this proposal.

No review notes have been added.

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Last Updated: 02/08/2022 11:01 [Contact Information](#)

Biomedical Physics Certificate program will have a unique combination of courses from Physics, Chemistry, Biology, and Biomedical science. The proposed courses will provide a combination of scientific and educational training in physics, biochemistry, and biological principles, radiation physics applications, human anatomy and radiology principle as well as radiation safety analysis and control methods. Students mainly from science disciplines can enroll in this certificate which will help in finding job in research and development for both basic and applied work related to medical devices and applications.

Estimated Costs:

None

Biomedical Physics Certificate

This certificate distinguishes the holder as attaining a level of proficiency with biomedical physics concepts and operational methods in the field.

Program requirements (14-15 hours)

1. **PHY 124(4) or PHY 204(5), BIO 121(4) or BMS 110+BMS 111(4), CHM 342(3) or BMS 599(3), and PHY 373(3)**
2. All candidates must satisfy the [General University Certificate Requirements](#).

Computational Science Certificate

Computational Science

This certificate provides students with a background in the application of computer code to the solution of problems of interest to those in science, mathematics, or engineering. Physical processes that are intractable to an analytical approach, can be studied and simulated using the algorithms and techniques developed in this certificate program.

Program requirements (12 hours)

1. [PHY 291\(3\)](#), [PHY 591\(3\)](#), [CSC 130\(3\)](#).
2. Three additional hours approved by certificate advisor.
3. All candidates must satisfy the [General University Certificate Requirements](#).

Applied Geophysics

This certificate provides a program for students and professionals who desire knowledge of the methods and theories of applying geophysical techniques to the study of Earth systems.

Program requirements (12 hours)

3. [GLG 590\(3\)](#) and [591\(3\)](#).
4. Two courses from: [GLG 573\(3\)](#), [GLG 574\(3\)](#), [MTH 302\(3\)](#), [MTH 303\(3\)](#), [PHY 291\(3\)](#), [PHY 319\(3\)](#).
5. All candidates must satisfy the [General University Certificate Requirements](#).

Note: Students completing a major other than Geology may request a waiver of the GLG 340 prerequisite requirement for GLG 591 if they have completed either MTH 302 or 303 and either PHY 291 or 391.

Workplace Writing

This certificate is designed for students who are interested in strengthening their writing skills and ability to analyze audiences and communicate complex information.

Program requirements (12 hours)

1. [ENG 321\(3\)](#), [373\(3\)](#), [377\(3\)](#), [421\(3\)](#).
2. All candidates must satisfy the [General University Certificate Requirements](#).

Financial Awareness

This certificate is designed to provide non-Finance majors exposure to information and skills that are useful in making individual financial decisions. Specifically, the certificate provides insight into four subjects a person will likely encounter in their lifetime: real estate, financial planning, the legal environment, and insurance.

Program requirements (12 hours)

1. [FIN 266\(3\)](#), [FIN 381\(3\)](#), [LAW 231\(3\)](#), [RMI 211\(3\)](#).
2. All candidates must satisfy the [General University Certificate Requirements](#).

Program restriction

This certificate is only available to students who are not majoring in Finance.

Completion requirement

Attain a grade of C or better in all courses used to fulfill the certificate requirements.

Prerequisites

1. Prerequisite for FIN 266 is 15 hours.
2. Prerequisite for FIN 381 is 54 hours.
3. Prerequisite for LAW 231 is 24 hours.
4. Prerequisite for RMI 211 is 15 hours.

Engineering Geology

This certificate will allow geology majors to document additional competencies relevant to careers in the geotechnical and civil/environmental engineering fields. Engineering students will gain additional perspectives on the geological aspects of civil engineering. Students from related majors interested in careers in the geotechnical industry will also gain career-relevant skills that complement their area of major study.

Program requirements (13 hours)

1. [GRY 275\(3\)](#), [GLG 110\(4\)](#), [GLG 573\(3\)](#).
2. One course from: [GLG 572\(3\)](#), [580\(3\)](#), [590\(3\)](#).
3. All candidates must satisfy the [General University Certificate Requirements](#).

Note: The GLG prerequisites for GLG 573, 572, 580 and 590 may be waived for non-geology majors at the discretion of the department head, assuming that student has already completed GLG 110 and any MTH prerequisites for the course.

Note: Students in the cooperative engineering program may contact the Geography, Geology, and Planning department head to request a substitution for GLG 572.

Completion requirement

Attain a grade of C or better in all courses used to fulfill the certificate requirements.

Available Courses include:

AST 311: Astronomical Techniques

PHY 324: Instrumental/Computer Interfacing

PHY 351: Circuit, Signals, and Controls

PHY 385: Experiments in Modern Physics

PHY 486 (depending on project)

MAT 514: Techniques in Electron Microscopy

CHM 302: Introduction to Analytical Chemistry CHM 170 and CHM 171 (CHM 160)

CHM 375: Inorganic Chemistry CHM 170 (CHM 160)

CHM 353: Introduction to Biochemistry Laboratory CHM 171 or CHM 342 and CHM 352

CHM 445: Intermediate Organic Chemistry Laboratory CHM 343 and CHM 345

CHM 462: Environmental Chemistry Laboratory CHM 302 and CHM 460

Are there other chemistry lab courses our majors might be taking anyway? Chemistry has many, many lab courses

BIO 213: Elements of Microbiology Laboratory BIO 212 (concurrent; CHM 116 and CHM 117 + 4hrs of BIO or BMS)

BIO 313: Microbiology Laboratory BIO 312 (concurrent: BIO 235 and BIO 236 and CHM 116 and CHM 117)

BIO 512: Industrial Microbiology BIO 212 and BIO 213 (CHM 116 and CHM 117 + 4hrs of BIO or BMS)

GLG 530: Optical Mineralogy GLG 333 (GLG 332, GLG 110, CHM160, MTH135)

GLG 540: X-Ray Mineralogy GLG 332 (GLG 110, CHM160, MTH135)

Prereqs:

AST 114 or AST 115

PHY 152

PHY 152

PHY 375 (PHY 204, MTH 302)

PHY 386

Biomedical Physics Certificate program will have a unique combination of courses from Physics, Chemistry, Biology, and Biomedical science. The proposed courses will provide a combination of scientific and educational training in physics, biochemistry, and biological principles, radiation physics applications, human anatomy and radiology principle as well as safety analysis and control methods. Students from various science disciplines can have this certificate which will help in finding job in a research and development team for both basic and applied work related to medical devices.

Curricular Action Workflow



Missouri State / Computer Services - MIS / Curricular Action Workflow / **CAW - Change Course Proposal Form**

Change Course Proposal Form

Submitted on 02/13/2022 by Kartik Ghosh (Kartikghosh@missouristate.edu).

***All fields require input**

This proposal applies to:

- An existing COURSE
- An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

PHY373 Radiation Physics

Will this proposal need to be reviewed by CGEIP? No Yes

Will this proposal need to be reviewed by EPPC? No Yes

Is there a graduate/undergraduate parallel course to this one? No Yes

Current online catalog description:

PHY 373 Radiation Physics

Prerequisite: PHY 124 or PHY 204. Theory of and measurement techniques for electromagnetic and particulate radiation. 3(2-2) F

Revise the current online catalog description as needed: (Strikethrough all deletions and insert/bold new information. Any content that is copied and pasted will lose existing formatting; please review prior to submission.)

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PHY 373 Radiation Physics

Prerequisite: PHY 124 or PHY 204. ~~Theory of and measurement techniques for electromagnetic and particulate radiation.~~ **Basic principles of electromagnetic and particulate radiation physics including, production of ionizing radiation and its interactions with biological tissue, radioactive decay, radiation detectors, dosimetry, and radiation imaging. The course will include lectures, experiments, and demonstrations.**3(2-2) F

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What is changing? Check all boxes that apply.

- | | | | |
|---|--|---|---------------------------------------|
| <input type="checkbox"/> Course Code | <input type="checkbox"/> Course Number (<u>Check Availability</u>) | <input type="checkbox"/> Title | <input type="checkbox"/> Prerequisite |
| <input type="checkbox"/> Credit Hours/Contact Hours | <input type="checkbox"/> Periodicity | <input checked="" type="checkbox"/> Description | |

Reason for proposed change

The proposed change allows to incorporate radiation effect on biological system which is an important part in the proposed Biomedical Physics Certificate Program. This course will not only be taken by Physics Students, but also by students from other department who wants to get the Biomedical Physics Certificate

Does this change affect course assessment (e.g. student learning evidence/outcomes)? No Yes

Explain.

In addition, students will learn the physics of radiation effect in biological system.

How did you determine the need for this change? Check all boxes that apply or specify other.

- | | | |
|--|---|--|
| <input type="checkbox"/> Routine or annual review/assessment of curriculum | <input type="checkbox"/> Faculty Input | <input type="checkbox"/> Student Input |
| <input type="checkbox"/> Accreditation/certification compliance | <input checked="" type="checkbox"/> Review of catalog information | |
| <input type="checkbox"/> Other (be specific): | | |

Check if this is a non-substantive change.

What is the date that this course change was approved by departmental or program faculty?
(MM/DD/YYYY)

02/11/2022

Current Status:

College Council Review

Proposal Progress:

02/14/2022 - Submitted by Department Head (Robert Mayanovic)

Review Comments:

No comments have been added to this proposal.

No review notes have been added.

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