Submitted to UGSC on Sept 23, 2024 by David Gidalevitz (PHYS)

Program Change Request

Date Submitted: 04/24/24 10:30 am

Viewing: BS-ASPY-1 : Bachelor of Science in Astrophysics

Last approved: 07/01/22 10:58 am

Last edit: 04/24/24 10:30 am

Changes proposed by: segre

Catalog Pages Using this Program

Bachelor of Science in Astrophysics

Program Status	Active		
Requestor	Name	Carlo Segre ~~Patty Johnson Winston~~	E-mail segre@iit.edu
Origination Date	2024-4-24 ~~2022-7-1~~		
Is this an interdisciplinary program?	No		
Academic Unit	Physics		
College	Lewis College of Science and Letters		
Program Title	Bachelor of Science in Astrophysics		
Effective Academic Year	2024 ~~2022~~ - 2025 ~~2023~~	Effective Term	Spring 2025
Academic Level	Undergraduate		

In Workflow

1. PHYS Chair
2. Academic Affairs
3. Undergraduate Academic Affairs
4. LS Dean
5. Undergraduate Studies Committee Chair
6. Faculty Council Chair
7. Academic Affairs

Approval Path

1. 04/24/24 10:42 am Pavel Snopok (psnopok): Approved for PHYS Chair
2. 04/30/24 3:09 pm Ayesha Qamer (aqamer): Approved for Academic Affairs
3. 04/30/24 3:20 pm Joseph Gorzkowski (jgorzkow): Approved for Undergraduate Academic Affairs
4. 04/30/24 3:31 pm Jennifer deWinter (jdewinter): Approved for LS Dean

History

1. Oct 25, 2017 by clmig-jwehrheim
2. Nov 3, 2017 by Sarah Pariseau

(sparisea)
3. Feb 13, 2018 by Sally Laurent-Muehleisen (slaurent)
4. Apr 27, 2018 by Sarah Pariseau (sparisea)
5. Feb 4, 2019 by Sarah Pariseau (sparisea)
6. Dec 24, 2019 by Sally Laurent-Muehleisen (slaurent)
7. Oct 23, 2020 by Holli Pryor-Harris (pryor)
8. Jul 1, 2022 by Patty Johnson Winston (winston)
9. Jul 1, 2022 by Patty Johnson Winston (winston)

If all courses in a subject in your department are required, please enter each subject followed by the number ranges in the "Quick Add" field in the pop up box when you click the green plus button below. For example: ARCH 100-499.

What courses will factor the major GPA?

Program Type Degree

Degree Type Bachelor of Science (BS)

CIP Code
40.0202 - Astrophysics.

Is there more than one Academic Unit proposer?

No

Program Code BS-ASPY-1

Program Attribute

Total Program Credit Hours 120 ~~126~~

Rationale for change in program credit hours.

Making changes to comply with new minimum credit hours for Illinois Tech B.S. degrees of 120.

Please provide a summary and rationale for the requested program revision.

We are dropping PHYS 348 (Modern Physics for Scientists and Engineers) as a required course for all our departmental majors (as well as the Physics minor). The material in PHYS 348 is covered completely in the combination of PHYS 223/224, PHYS 304, and PHYS 405 (all required classes) making the material in PHYS 348 redundant. Having PHYS 348 as part of our required curriculum is therefore not necessary and effectively serves as a hindrance in its current role as the gatekeeper for all higher level physics classes. Replacing PHYS 348 with a Technical Elective (defined below) will better serve our Astrophysics majors.

10/23/2020 Updated program iteration code and effective CAT year/term for College Reorg. HPH

07/01/2022, PJW: Corrected bulletin spacing issues in source code.

04/24/2024 - Reduce minimum Credit hours to 120. CUS

Program Narrative and Justification

Narrative description of how the institution determined the need for the program. For example, describe what need this program will address and how the institution became aware of that need. If the program is replacing a current program(s), identify the current program(s) that is being replaced by the new program(s) and provide details describing the benefits of the new program(s). If the program will be offered in connection with, or in response to, an initative by a governmental entity, provide details of that initiative.

Narrative description of how the program was designed to meet local market needs, or for an online program, regional or national market needs. For example, indicate if Bureau of Labor Statistics data or State labor data systems information was used, and/or if State, regional, or local workforce agencies were consulted. Include how the course content, program length, academic level, admission requirements, and prerequisites were decided; including information received from potential employers about course content; and information regarding the target students and employers.

Narrative description of any wage analysis the institution may have performed, including any consideration of Bureau of Labor Statistics wage data related to the new program.

Narrative description of how the program was reviewed or approved by, or developed in conjunction with, one or more of the following: a) business advisory committees; b) program integrity boards; c) public or private oversight or regulatory agencies (not including the state licensing/authorization agency and accrediting agency); and d) businesses that would likely employ graduates of the program. For example, describe the steps taken to develop the program, identify when and with whom discussions were held, provide relevant details of any proposals or correspondence generated, and/or describe any process used to evaluate the program.

Admission Entry Details

What are the enrollment estimates?

Year 1 Year 2 Year 3

Attach Additional Program Justification Document(s)

Academic Information

Advising

Since quality advising is a key component of good retention, graduation, and career placement, how will students be mentored? What student professional organizations will be formed? How will the department work with the Career Services office to develop industry connections?

Program Resources

Which program resources are necessary to offer this program?

Proposed Catalog Entry

Admission Requirements

Course Requirements

Required Courses

Physics Requirements		**(37)**
PHYS 100	Intro to the Profession	2
PHYS 123	General Physics I: Mechanics	4
PHYS 221	General Physics II: Electricity and Magnetism	4
PHYS 223	General Physics III	4
PHYS 240	Computational Science	3
PHYS 301	Mathematical Methods of Physics	3
PHYS 304	Thermodynamics and Statistical Physics	3
PHYS 308	Classical Mechanics I	3
~~PHYS 309~~	~~Classical Mechanics II~~	~~3~~
PHYS 405	Fundamentals of Quantum Theory I	3
PHYS 413	Electromagnetism I	3
PHYS 427	Advanced Physics Laboratory I	3
PHYS 485	Physics Colloquium	1
PHYS 485	Physics Colloquium	1
Astronomy Requirements		**(16)**
PHYS 360	Introduction to Astrophysics	3
PHYS 361	Observational Astrophysics	4
PHYS 403	Relativity	3
PHYS 460	Stellar Astrophysics	3
PHYS 461	Extragalactic Astrophysics	3
~~Technical Elective Requirement~~		
~~Select 3 credit hours~~ [1]		~~3~~
Mathematics Requirements		**(18)**
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4

Chemistry Requirements		**(8)**
CHEM 124	Principles of Chemistry I with Laboratory	4
CHEM 125	Principles of Chemistry II with Laboratory	4
Computer Science Requirement		**(2)**
CS 105	Introduction to Computer Programming	2
Humanities and Social Science Requirements		**(21)**
See Illinois Tech Core Curriculum, sections B and C		21
Interprofessional Projects (IPRO)		**(6)**
See Illinois Tech Core Curriculum, section E		6
Free Electives		**(12)**
Select 12 credit hours		12
Total Credit Hours		120

~~1~~

~~A technical elective is:~~

~~Any Physics course at or above the 300-level~~

~~OR~~

~~Any College of Science or College of Engineering course at or above the 300-level, chosen with approval of the student's advisor~~

Sample Curriculum/Program Requirements

Bachelor of Science in Astrophysics Curriculum

			Year 1
Semester 1	Credit Hours	Semester 2	Credit Hours
PHYS 100	2	PHYS 221	4
PHYS 123	4	MATH 152	5
MATH 151	5	CHEM 125	4
CHEM 124	4	Humanities or Social Sciences Elective	3
	15		16
			Year 2
Semester 1	Credit Hours	Semester 2	Credit Hours
PHYS 223	4	PHYS 240	3
MATH 251	4	~~PHYS 304~~	~~3~~
CS 105	2	PHYS 360	3
Humanities 200-level Course	3	MATH 252	4
Social Sciences Elective	3	Humanities Elective (300+)	3
	16		13
			Year 3

Semester 1	Credit Hours	Semester 2	Credit Hours
PHYS 301	3	~~PHYS 309~~	~~3~~
PHYS 308	3	PHYS 304	3
PHYS 361[1]	4	PHYS 460[3]	3
PHYS 405[2]	3	Free Elective	3
Free Elective	3	IPRO Elective I	3
		Social Sciences Elective (300+)	3
	16		15

Year 4

Semester 1	Credit Hours	Semester 2	Credit Hours
PHYS 413	3	PHYS 403[3]	3
PHYS 427	3	PHYS 485	1
PHYS 461[3]	3	~~Technical Elective~~[4]	~~3~~
PHYS 485	1	IPRO Elective II	3
Free Elective	3	Free Elective	3
Humanities Elective (300+)	3	Social Sciences Elective (300+)	3
	16		13

Total Credit Hours: 120

1 PHYS 361 is offered every other fall semester.

2 PHYS 405 can also be taken in the 7th semester with a free elective moved to the 5th semester.

3 These three courses will be offered in a three-semester rotation and taken by 3rd and 4th year students together.

4 ~~A technical elective is:~~

~~Any Physics course at or above the 300-level~~

~~OR~~

~~Any College of Science or College of Engineering course at or above the 300-level, chosen with approval of the student's advisor~~

Specialization Requirements

Program Outcomes and Assessment Process

What are your learning objectives in this program? Please list each learning objective in the boxes below:

Note: These should be the same as described in your assessment plan at the bottom of this form.

Upload your assessment plan here:

Undergraduate Program Requirements

What courses will factor the major GPA?

Undergraduate Degree Requirements

Minimum credit hours: 120 ~~126~~

Specialization required?
No

Minor required?
No

Proposed General Curriculum

List Major Course Requirements

List Mathematics Requirements

List Science Requirements

List Computer Science

Requirements	
List Humanities and Social Sciences Requirements	
List Interprofessional Project (IPRO) Requirements	
List Technical Elective Course Options	
List Free Elective Credit Hours (if applicable)	12
Semester-by-semester plan of study for the degree program	

Report to Faculty Council	
Reviewer Comments	

Key: 48