

B. A. IN MUSIC PLUS A SECONDARY MAJOR IN PHYSICS

- The B.A. degree in Music requires 124 credits.
 - 66 hours must be non-music credits.
 - 40 hours must be 300 or 400-level courses.
 - All music majors have Arts Event Attendance Requirements; for details, check <https://www.butler.edu/jca/for-current-students>.
- The double major of Music and Physics will fulfill the following Areas of Inquiry in the University Core Curriculum: Perspectives of the Creative Arts, The Natural World, and Analytic Reasoning. In addition, the B.A. Music curriculum fulfills the Social Justice and Diversity requirement of the Butler University Core Curriculum; music majors are exempted from the Butler Cultural Requirement because of the arts event attendance requirements for all arts majors. The Indianapolis Community Requirement is NOT satisfied.
- The student will be assigned a Physics advisor in addition to their Music advisor.

Semester 1

AM 021*	Keyboard Skills 1	1
<i>*If the major instrument is piano, the student should take AM 031, Piano Major: Keyboard Skills 1 and AM 032, Piano Major: Keyboard Skills 2 instead of AM 021, AM 022, AM 023, and AM 024.</i>		
AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1
MT 101	Music Theory 1	3
MT 111	Aural Skills 1	1
FYS 101	First Year Seminar	3
PWB ____	Physical Well-Being	1
MA 106*	Calculus & Anal. Geo. 1	4
Language Elective		3

Explanation: 6 hours of the same language at the 200-level or higher are required.

TOTAL Credit Hours: 19

Semester 2

AM 022*	Keyboard Skills 2	1
AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1
ME 330	Self-Represent for Musicians	1
MT 102	Music Theory 2	3
MT 112	Aural Skills 2	1
FYS 102	First Year Seminar	3
MA 107	Calculus & Anal Geo. 2	4
Language Elective		3

Explanation: 6 hours of the same language at the 200-level or higher are required.

TOTAL Credit Hours: 19

**Math placement test required; the student may need to take MA 101 (Algebra, 3 cr.) and/or MA 102 (Precalculus, 3 cr.) prior to MA 106. Students get credit for MA 106 if they receive a 4 or 5 on the Calculus AB AP exam; they receive credit for both MA 106 and MA 107 if they receive a 4 or 5 on the Calculus BC AP exam with a 4 or 5 on the AB subscore.*

Semester 3

AM 023	Keyboard Skills 3	1
AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1

Semester 4

AM 024	Keyboard Skills 4	1
AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1

MT 201	Music Theory 3	3	MT 202	Music Theory 4	3
MT 211	Aural Skills 3	1	MT 212	Aural Skills 4	1
GHS ____	Global and Historical Studies	3	GHS ____	Global and Historical Studies	3
MA 208	Calculus & Anal. Geo. 3	4	MA 310	Linear Algebra	3
PH 201	Intro to Anal. Physics 1	5	PH 202	Intro to Anal. Physics 2	5
TOTAL Credit Hours:		20			19

Semester 5

AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1
MH 308-SJD	Music in Global Contexts	3
SW ____	The Social World	3
AS 311**	Astrophysics 1	3
PH 301	Modern Physics	3
PH 331	Electromagnetic Theory	4

TOTAL Credit Hours: 19

Semester 6

AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1
MH 305	Music History 1	2
MA 334	Differential Equations	3
PH 303	Electromag Waves & Optics	3
PH 311	Experiment Modern Physics	3
PH 315**	Math Methods for Physics	4

TOTAL Credit Hours: 18

***Not required for the Physics major, but recommended for students considering graduate school in Physics.

Semester 7

AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1
MH 306	Music History 2	3
TI ____	Texts and Ideas	3
AS 340**	Cosmol & Extragal Astrophy	3
PH 421	Quantum Theory	4
PH 461**	Computational Physics	3
PH 490	Colloquium	0
PH 495	Senior Seminar	1

TOTAL Credit Hours: 20

Semester 8

AM ____	Major Instrument or Voice	2
ES ____	Major Ensemble	1
ME 430	E-Portfolio Capstone	0
MH 307	Music History 3	3
PH 321	Inter Classical Mechanics	4
PH 325	Therm & Statistical Physics	4
PH 422**	Quantum Theory 2	4

TOTAL Credit Hours: 18

***Not required for the Physics major, but recommended for students considering graduate school in Physics.

SUMMARY

REQUIRED MUSIC COURSES:

Note: The 8-semester sequence shown above includes AM 021 and AM 022, as well as 4 additional semesters of Applied Music (8 credits) and 2 additional semesters of Major Ensemble (2 credits), in addition to the courses listed below. While not required in the B.A. degree, most music majors will take these additional classes for placement or scholarship reasons.

AM 023,024*	Keyboard Skills 3,4	2
*AM 031 & AM 032 if major instrument is piano		
AM ____	Major Instrument or Voice	8
ES ____	Major Ensemble	6
ME 330	Self-Representation for Musicians	1
ME 430	E-Portfolio Capstone	0
MH 305	Music History and Literature 1	2
MH 306	Music History and Literature 2	3
MH 307	Music History and Literature 3	3
MH 308-SJD	Music in Global Contexts	3
MT 101	Music Theory 1	3
MT 111	Aural Skills 1	1
MT 102	Music Theory 2	3
MT 112	Aural Skills 2	1
MT 201	Music Theory 3	3
MT 211	Aural Skills 3	1
MT 202	Music Theory 4	3
MT 212	Aural Skills 4	1
TOTAL		44 (plan shows 56 music credits per the note above)

UNIVERSITY CORE CURRICULUM:

FYS 101,102	First Year Seminar	3,3
GHS ____	Global and Historical Studies	3,3
SW ____	The Social World (if needed)	3
TI ____	Texts and Ideas	3
PWB ____	Physical Well-Being	1
TOTAL		19

COURSES REQUIRED FOR THE PHYSICS MAJOR:

NOTE: Many upper-level physics courses require one or more of the following math courses as prerequisites (included in the plan above):

MA 106*	Calculus & Anal Geometry 1	4
MA 107	Calculus & Anal Geometry 2	4
MA 208	Calculus & Anal Geometry 3	4
MA 310	Linear Algebra	3
MA 334	Differential Equations	3
PH 201	Introduction to Analytical Physics 1	5
PH 202	Introduction to Analytical Physics 2	5
PH 301	Modern Physics	3
PH 303	Electromagnetic Waves and Optics	3
PH 311	Experimental Modern Physics	3
PH 321	Intermediate Classical Mechanics	4
PH 325	Thermodynamics and Statistical Physics	4

PH 331	Electromagnetic Theory	4
PH 421	Quantum Theory	4
PH 490	Colloquium	0
PH 495	Senior Seminar	1
TWO AS/PH Electives, chosen from:		6-8
AS 301	Modern Astronomical Techniques	3
AS 311	Astrophysics 1	3
AS 312	Astrophysics 2	3
AS 340	Cosmology & Extragalactic Astrophysics	3
PH 315	Mathematical Methods for Physics	4
PH 351	Analog Electronics 1	4
PH 422	Quantum Theory 2	4
PH 427	General Relativity and Gravity 1	3
PH 461	Computational Physics	3
PH 480	Special Topics	3
Language	6 hours of the same language at the 200-level or higher	
TOTAL		48-50 (plus 18 additional math credits, if necessary)

**Math placement test required; the student may need to take MA 101 (Algebra, 3 cr.) and/or MA 102 (Precalculus, 3 cr.) prior to MA 106. Students get credit for MA 106 if they receive a 4 or 5 on the Calculus AB AP exam; they receive credit for both MA 106 and MA 107 if they receive a 4 or 5 on the Calculus BC AP exam with a 4 or 5 on the AB subscore.*

Additional courses recommended for students going to graduate school in Physics (included in the plan above, and fulfill the AS/PH Elective requirement):

AS 311	Astrophysics 1	3
AS 340	Cosmology & Extragalactic Astrophysics	3
PH 315	Mathematical Methods for Physics	4
PH 422	Quantum Theory 2	4
PH 461	Computational Physics	3