

## Exhibit 16

### TRANSFER ADVISING GUIDE

**Bucks County Community College to University of the Sciences in Philadelphia**  
**A.S. Mathematics (1006) → B.S. Physics (Tracks: General, Material Sciences, Astrophysics)**

**Bucks Associate of Science  
Mathematics (1006)**

**USciences Bachelor of Science  
Physics (General, Material Sciences, Astrophysics)**

Bucks Courses	Cr.	USciences Courses	Cr.
CISC115 Computer Science I	4	MS X01 ( <i>serves as Free Elective</i> )	3
CHEM121 Chemistry I	4	CH111 Principles of Chemistry I CH113 Principles of Chemistry Lab I	3 1
CHEM122 Chemistry II ( <i>serves as Elective</i> )	4	CH112 Principles of Chemistry II CH114 Principles of Chemistry Lab II	3 1
COMP110 English Composition I	3	WR101 Writing & Rhetoric I	3
COMP111 English Composition II	3	WR102 Writing & Rhetoric II	3
COMM110 Effective Speaking	3	CO101 Introduction to Communication	3
MATH125 Pre-calculus	4	MA107 Pre-calculus	3
MATH140 Calculus I	4	MA122 Calculus I	4
MATH141 Calculus II	4	MA221 Calculus II	4
MATH242 Calculus III	4	MA222 Calculus III	4
MATH260 Linear Algebra	3	MA316 Linear Algebra	3
MATH250 Differential Equations ( <i>serves as Mathematics Elective</i> )	3	MA320 Differential Equations	3
MATH121 Discrete Mathematics	3	MA314 ( <i>serves as Free Elective</i> )	3
PHYS121 Physics I ( <i>serves as Elective</i> )	4	PY211 Physics I	4
PHYS122 Physics II ( <i>serves as Elective</i> )	4	PY212 Physics II	4
Arts/Humanities <b>Choose One</b> (LITR254, LITR255, LITR261, MUSC101, PHIL125, FREN110, SPAN110, SPAN111, GRMN110, JPNS101, JPNS102)	3	( <i>serves as GenEd MD Requirement</i> )	3
Social Science: <b>Choose One</b> ECON111 Principles of Economics: Macro POLI111 American National Government PSYC110 Introduction to Psychology SOC110 Introduction to Sociology	3	( <i>serves as GenEd MD Requirement</i> ) EC101 Intro to Macroeconomics PO101 Intro to Political Sci & Am Gov't PS101 Introduction to Psychology SO101 Introduction to Sociology	3
<b>Choose One:</b> [ <i>Serves as elective</i> ] [KINS 106,110,116,118,120,122,124,129, 130,133,134,135,141,142,145,150,154,155,156, 170,172,175-179,188,189]	2	PE101/102 Physical Education I/II	1
<b>Bucks Credits toward AS</b>	<b>62</b>	<b>Credits Accepted</b>	<b>59</b>

<b>Additional Courses Necessary to Enter USciences with Junior (U3) Status:</b>			
<u>Social Sciences: Choose one</u>  <b>CRIJ</b> 110,115,116,120,130,140,160,210,220,230, 250,260,270,275,280,285 <b>ECON</b> 111,112,120 <b>POLI</b> 111,112,120,130,212 <b>PSYC</b> 100,110,160,180,181,185,190,200,205,215, 230,270,280 <b>SOCI</b> 110,120,130,140,150,160, <b>SSWK</b> 115,140,215,255	3	<i>(serves as GenEd Social Sciences Requirement)</i>	3
<b>Total Bucks Credits</b>	<b>65</b>	<b>Total Credits Accepted</b>	<b>62</b>

A minimum 2.7 cumulative GPA is required for admission.

A minimum grade of “B” in all science and mathematics courses (Prefixes: CHEM, MATH, PHYS, BIOL). Students who do not meet these minimum grade requirements can still transfer under the terms of this articulation agreement, subject to departmental review and approval.

The courses encompassed in the A.S. degree from Bucks must be completed within the three years preceding matriculation at USciences. Students who take more than 3 years to complete the A.S. degree can still transfer under this articulation agreement, subject to departmental review and approval.

PY100 - Physics Orientation (1 cr) will be waived for students transferring to USciences after earning the A.S. in Mathematics (1006). However, the total credits required for graduation (includes transfer credits) will remain unchanged.

Graduation from USciences with a BS degree requires completion of specified courses and a total of 121-136 credit hours, depending upon the degree program. In order to enter USciences with U3 (junior) status and to facilitate the completion of a BS degree in two years of study at USciences, all students are strongly advised to complete more than 60 total credits of course work which is eligible for transfer to USciences. Students interested in transferring to USciences are strongly urged to contact the USciences Admission Office early in their enrollment at Bucks for advising.

In addition to the coursework provided in the above table, the following types of courses will be needed to complete the *General Education Discipline Requirements* in USciences' General Education Curriculum:

- 3 credits in Social Sciences
- 6 credits in Humanities

Some or all of these 9 credits of coursework can be taken at Bucks or after transferring to USciences (currently included in the 3<sup>rd</sup> and 4<sup>th</sup> year at USciences). If the 9 credits are taken at Bucks, they should be selected from the following lists:

<p><b>3 credits in Social Sciences: Select ONE</b></p> <p><b>CRIJ</b> 100, 110,115,116,120,130,140,160,210,220, 230,250,260,270,275,280,285</p> <p><b>ECON</b> 111,112,120</p> <p><b>POLI</b> 130, 111,112,120 ,212</p> <p><b>PSYC</b> 100,110,160,180,181,185,190,200,205,215, 230,270,280</p> <p><b>SOCI</b> 120,130,140,150,160</p> <p><b>SSWK</b> 115,140,215,255</p>	<p><b>GenEd Discipline Requirements – Social Sciences</b></p> <p>SO207 Crime, Drugs and Policy EC101, EC201, ECX01 PO101, POX01</p> <p>PS SO, AN SO</p>
<p><b>6 credits in Humanities: Select TWO</b></p> <p><b>AMSL</b> 110,111</p> <p><b>COMM</b> 111,210,230</p> <p><b>FREN</b> 110,111,201,202,250,251</p> <p><b>GRMN</b> 110,111,201,202,250,251</p> <p><b>HIST</b> 101,111,112,121,126,131,136,139,140,141, 143,144,146,149,151-156,159,160,170,172-178,180, 190,194-199,200-208,210,214,216,217,218,219,239, 245,281,288</p> <p><b>HUMN</b> 107,108,110-114,120,121,122,125,127, 128,129,166</p> <p><b>ITAL</b> 110,111,201,202</p> <p><b>JOUR</b> 155,175,275,276,277,278,280</p> <p><b>JPNS</b> 101,102</p> <p><b>LITR</b> 205,206,231,232,234,235,246,254,255,261,262, 264,271,273,275,277,278,279</p> <p><b>MUSC</b> 100,101,103,105,106,111,112,115,116,124, 129,130,188,201,202,206,211,212,215,216,230</p> <p>PHIL 105,111,115,125,140,145</p> <p><b>SPAN</b> 110,111,201,202,250,251</p> <p><b>VAF</b> 100,110,141,147,148,149,151,157,160,161, 165,167,168,169,171,181,191-196,200,202,203, 210,211,242,246,249,257,260,261,271,282</p> <p><b>VAFW</b> 100,133,136,137,138,140,145,180,181, 190,280</p> <p><b>WMST</b> 110</p>	<p><b>GenEd Discipline Requirements – Humanities</b></p> <p>HUX01 HUX01 FR, HU GE, HU HI, HU</p> <p>HU</p> <p>IT, HU EN HU EN</p> <p>MU</p> <p>SP AR</p> <p>AR</p> <p>HU</p>

Suggested checklist for 3<sup>rd</sup> and 4<sup>th</sup> year at USciences for **BS in Physics (General track)** based on current approved curriculum:

*(this checklist is for planning purpose only and it is subject to changes; it does not constitute a contract)*

THIRD YEAR AT USCIENCES		
PY 213	Physics III	3
ST 320	Introduction to Probability	3
	GenEd Humanities Requirement	3
PY 301	Modern Physics I	3
PY 310	Mechanics	3
PY 370	Math Methods for Phys Sci I	3
PY 380	Electronics	3
PY 406	Advanced Lab	1
PY 410	Electricity and Magnetism	3
PY 420	Optics and Wave Phenomena	3
PY 450	Quantum Mechanics	3
PY 371	Math Methods for the Phys Sci II	3

FOURTH YEAR AT USCIENCES		
PY 495	Undergraduate Research in Physics	2
	Physics Elective	3
PY 431	Statistical Mechanics	3
	GenEd Humanities Requirement	3
	GenEd Social Sciences Requirement	3
PY 496	Advanced Research in Physics	3
	Physics Elective	6
	Physics/Biology/Chem elective	3
CS 201	Computer Programming I	3
PY 305	Physics Seminar	3

\* students transferring Fall 19 and beyond will have to take this additional course

Suggested checklist for 3<sup>rd</sup> and 4<sup>th</sup> year at USciences for **BS in Physics (Material Science track)** based on current approved curriculum:

*(this checklist is for planning purpose only and it is subject to changes; it does not constitute a contract)*

THIRD YEAR AT USCIENCES		
PY 213	Physics III	3
ST 320	Introduction to Probability	3
	GenEd Humanities Requirement	3
PY 301	Modern Physics I	3
PY 310	Mechanics	3
PY 370	Math Methods for Phys Sci I	3
PY 380	Electronics	3
PY 406	Advanced Lab	1
PY 410	Electricity and Magnetism	3
PY 420	Optics and Wave Phenomena	3
PY 450	Quantum Mechanics	3
PY 371	Math Methods for the Phys Sci II	3

FOURTH YEAR AT USCIENCES		
PY 480	Introduction to Material Science	3
PY 495	Undergraduate Research in Physics	2
PY 431	Statistical Mechanics	3
	GenEd Humanities Requirement	3
	GenEd Social Sciences Requirement	3
PY 470	Solid State Physics	3
PY 496	Advanced Research in Physics	3
PY 440	Intro to Nano Science	3
	Physics/Biology/Chem elective	3
CS 201	Computer Programming I	3
PY 305	Physics Seminar	3

\* students transferring Fall 19 and beyond will have to take this additional course

Suggested checklist for 3<sup>rd</sup> and 4<sup>th</sup> year at USciences for **BS in Physics (Astrophysics track)** based on current approved curriculum:

*(this checklist is for planning purpose only and it is subject to changes; it does not constitute a contract)*

THIRD YEAR AT USCIENCES		
PY 213	Physics III	3
ST 320	Introduction to Probability	3
	GenEd Humanities Requirement	3
PY 301	Modern Physics I	3
PY 310	Mechanics	3
PY 370	Math Methods for Phys Sci I	3
PY 380	Electronics	3
PY 406	Advanced Lab	1
PY 410	Electricity and Magnetism	3
PY 430	Differential Geometry	3
PY 450	Quantum Mechanics	3
PY 371	Math Methods for the Phys Sci II	3

FOURTH YEAR AT USCIENCES		
PY 463	Physics of Stars and Black Holes	3
PY 495	Undergraduate Research in Physics	2
PY 431	Statistical Mechanics	3
	GenEd Humanities Requirement	3
	GenEd Social Sciences Requirement	3
PY 465	Intro to Cosmology	3
PY 496	Advanced Research in Physics	3
	Physics Elective	3
PY 420	Optics and Wave Phenomena	3
CS 201	Computer Programming I	3
PY 305	Physics Seminar	3

\* students transferring Fall 19 and beyond will have to take this additional course

## Progress in Completing USciences' General Education Curriculum

[For the most recent information, see the current USciences Catalog on its website]

### Discipline Requirements (minimum of 41 credits)

Discipline Requirement	Community College Courses // USciences Courses*
Natural Science (ONE semester of lab required) <b>7 credits</b>	CHEM121 CHEM122
Mathematics <b>6 credits</b>	MATH125 & MATH140
Communication (written & oral) <b>9 credits</b>	COMP110 & COMP111 & COMM110
Social Sciences <b>6 credits</b>	<p><b>Choose One:</b>  <b>CRIJ</b> 100, 110,115,116,120,130,140,160,210,220,            230,250,260,270,275,280,285  <b>ECON</b> 111,112,120  <b>POLI</b> 130, 111,112,120 ,212  <b>PSYC</b> 100,110,160,180,181,185,190,200,205,215,            230,270,280  <b>SOCI</b> 120,130,140,150,160  <b>SSWK</b> 115,140,215,255</p> <p><b>Choose One USciences Course:</b>            PO (Political Science), PS (Psychology), SO (Sociology), AN            (Anthropology), SS (Social Sciences),            EC (Economics), CO (excluding CO 101 and CO 204)</p>
Humanities <b>6 credits</b>	<p><b>Choose Two USciences Courses:</b>            AC (Arabic), AR (Art), , CI (Chinese), CA (Classics),            EN (excluding EN 101 and EN 102), FR (French),            GE (German), LA (Latin), HI (History), HU (Humanities),            MU (Music), PL (Philosophy), RS (Religious Studies),            SP (Spanish), WC (World Cultures)</p>
Multidisciplinary Inquiry <b>6 credits</b> (may be substitute by Social Sciences &/or Humanities courses)	<p><b>Choose One:</b>            ECON111 Principles of Economics: Macro            POLI111 American National Government            PSYC110 Introduction to Psychology            SOCI110 Introduction to Sociology</p> <p><b>Choose One: Arts/Humanities</b>            (LITR254, LITR255, LITR261, MUSC101, PHIL125, FREN110,            SPAN110, SPAN111, GRMN110, JPNS101, JPNS102)</p>
Physical Education <b>1 credit</b>	<p><b>Choose One:</b>            [KINS 106,110,116,118,120,122,124,129, 130,133,134,135,            141,142,145,150,154,155,156, 170,172,175-179,188,189]</p>

*Skills, Values, and Attitudes (one approved course for each)*

<b>Skills, Values, and Attitudes</b>	<b>Community College Course</b>	<b>USciences Course</b> [RED = courses taken after transferring to USciences]
Ethics		See list of USciences courses approved for Ethics
Information Literacy		See list of USciences courses approved for Inf Literacy
Oral Communication	SOCI110	OR PY 305
Reasoning & Problem Solving	PHYS121	
Technology	PHYS121	
Written Communication	PSYCH110	OR USciences course

Skills requirement is usually fulfilled by taking courses that satisfy discipline requirements that are also approved for one or more GenEd skill.