

Exhibit 12

TRANSFER ADVISING GUIDE

**Mercer County Community College (MCCC) to University of the Sciences in Philadelphia
A.S. Engineering Science → B.S. Physics (Physics Gen, Material Sc., Astrophysics Tracks)**

**MCCC Associate in Science
Engineering Science**

**USciences Bachelor of Science
Physics (Physics Gen, Material Sc., Astrophysics)**

MCCC Courses	Cr.	USciences Courses	Cr.
ENG101 English Composition I	3	WR101 Writing & Rhetoric I	3
ENG102 English Composition II	3	WR102 Writing & Rhetoric II	3
CMN112 Public Speaking	3	CO204 Public Speaking	3
MAT151 Calculus I	4	MA122 Calculus I	4
MAT152 Calculus II	4	MA221 Calculus II	4
MAT251 Calculus III	4	MA222 Calculus III	4
MAT252 Differential Equations	4	MA320 Differential Equations	3
CHE101 General Chemistry I	4	CH111 Principles of Chemistry I CH113 Principles of Chemistry Lab I	3 1
CHE102 General Chemistry II	4	CH112 Principles of Chemistry II CH114 Principles of Chemistry Lab II	3 1
PHY115 University Physics I	4	PY211 Physics I	4
PHY215 University Physics II	4	PY212 Physics II	4
PHY225 University Physics III	4	PY213 Physics III	4
CIV103 Statics	3	PY455 Intro to Fluidynamics	3
CIV230 Mechanics of Solids	4	PY310 Mechanics	3
ENT116 Engineering Graphics OR DRA190 Intro to Computer-Aided Drafting	2	MIX01 Misher Elective	2
COS101 Introduction to Computer Science	4	CS201 Computer Programming I	3
ECO112 Microeconomics	3	EC201 Intro to Microeconomics <i>(serves as GenEd Social Science Requirement)</i>	3
GenEd Elective (either Historical Perspective or Humanities) Choose One:	3	<i>(serves as GenEd MD Requirement)</i>	3
GenEd Elective (either Historical Perspective or Humanities) Choose One:	3	<i>(serves as GenEd MD Requirement)</i>	3
MCCC credits toward AS	67	Credits Accepted	64
Additional Courses Necessary to Enter USciences with Junior (U3) Status:			
Choose One: HPE110 Concepts of Health and Fitness HPE111 Living with Health CSW100 College Success and Personal Wellness	2	PE101/102 Physical Education I/II	1
Total MCCC Credits	69	Total Credits Accepted	65

A minimum 2.7 cumulative GPA is required for admission.

A minimum grade of “B” in all science and mathematics courses (Prefixes: CHE, MAT, PHY, BIO). 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 MCCC 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) and MA107 – Precalculus (3 cr) will be waived for students transferring to USciences after earning the A.S. in Engineering Science. 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 120-136 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 MCCC 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 MCCC or after transferring to USciences (currently included in the 3rd and 4th year at USciences). If the 9 credits are taken at MCCC, they should be selected from the following lists:

<p>3 credits in Social Sciences: Select ONE</p> <p>ANT101 Anthropology ECO103 Basic Economics ECO111 Macroeconomics ECO112 Microeconomics GEO101 Geography GEO102 Cultural Geography POL101 The American Political System POL102 State and Local Government POL201 International Relations PSY101 Introduction to Psychology PSY206 Child Development PSY207 Developmental Psychology SOC101 Introduction to Sociology SOC107 Social Problems</p> <p>6 credits in Humanities: Select TWO</p> <p>MCCC Humanities GenEd Elective</p>	<p>GenEd Discipline Requirements – Social Sciences</p> <p>AN103 Introduction to Antropology ECX01 Economics Elective EC101 Intro to Macroeconomics EC101 Intro to Microeconomics SSX01 Social Science Elective SSX01 Social Science Elective PO101 Intro to Pol Sci and Amer Gov POX01 Political Science Elective POX01 Political Science Elective PS101 Intro to Psychology PSX01 Psychology Elective PS200 Psych of Human Development SO101 Introduction to Sociology SOX01 Sociology Elective</p> <p>GenEd Discipline Requirements – Humanities</p>
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Suggested checklist for 3rd and 4th 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		
ST 320	Introduction to Probability	3
MA 316	Linear Algebra	3
	GenEd Social Sciences Requirement	3
PY 301	Modern Physics I	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 450	Quantum Mechanics	3
PY 371	Math Methods for the Phys Sci II	3

FOURTH YEAR AT USCIENCES		
PY 420	Optics and Wave Phenomena	3
PY 495	Undergraduate Research in Physics	2
PY 431	Statistical Mechanics	3
	GenEd Humanities Requirement	6
PY 496	Advanced Research in Physics	3
	Physics Elective	3
	Physics/Chemistry/Biology Elective	3
PY 305	Physics Seminar	3
	Free Electives	8

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

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THIRD YEAR AT USCIENCES		
ST 320	Introduction to Probability	3
MA 316	Linear Algebra	3
PY 301	Modern Physics I	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 Social Sciences Requirement	3
	GenEd Humanities Requirement	6
PY 470	Solid State Physics	3
PY 496	Advanced Research in Physics	3
PY 440	Intro to Nano Science	3
	Free Electives	8
PY 305	Physics Seminar	3

Suggested checklist for 3rd and 4th 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		
ST 320	Introduction to Probability	3
MA 316	Linear Algebra	3
PY 301	Modern Physics I	3
PY 370	Math Methods for Phys Sci I	3
PY 380	Electronics	3
PY 406	Advanced Lab	1
MA 430	Differential Geometry	3
PY 450	Quantum Mechanics	3
PY 371	Math Methods for the Phys Sci II	3

FOURTH YEAR AT USCIENCES		
PY 410	Electricity and Magnetism	3
PY 463	Physics of Stars and Black Holes	3
PY 495	Undergraduate Research in Physics	2
PY 431	Statistical Mechanics	3
	GenEd Social Sciences Requirement	3
	GenEd Humanities Requirement	6
PY 465	Intro to Cosmology	3
PY 496	Advanced Research in Physics	3
	Free Electives	5
PY 420	Optics and Wave Phenomena	3
PY 305	Physics Seminar	3

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) 7 credits	CHE101 & CHE102
Mathematics 6 credits	MAT151 & MAT152
Communication (written & oral) 9 credits	ENG101 & ENG102 & CMN111 or CMN112
Social Sciences 6 credits	ECO112 Choose One USciences Course: PO (Political Science), PS (Psychology), SO (Sociology), AN (Anthropology), SS (Social Sciences), EC (Economics), CO (excluding CO 101 and CO 204)
Humanities 6 credits	Choose Two USciences Courses: 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)
Multidisciplinary Inquiry 6 credits (may be substituted by Social Sciences &/or Humanities courses)	Choose One: GenEd Elective (either Hist persp or Humanit) Choose One: GenEd Elective (either Hist persp or Humanit)
Physical Education 1 credit	HPE110 or HPE111 or CSW100

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

Skills, Values, and Attitudes	Community College Course	USciences Course [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		PY305
Reasoning & Problem Solving	PHY115	
Technology	PHY115	
Written Communication	PSY101	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.