

## New Academic Program Workflow Form

### General

**Proposed Name: Science**

Transaction Nbr: 00000000000172

Plan Type: Major

Academic Career: Undergraduate

Degree Offered: Bachelor of Arts

Do you want to offer a minor? N

Anticipated 1st Admission Term: Fall 2023

### Details

Department(s):

#### SCNC

DEPTMNT ID	DEPARTMENT NAME	HOST
0442	Science Administration	Y

Campus(es):

#### ONLN

LOCATION	DESCRIPTION
ONLN	Online

**Admission application terms for this plan:** Spring: Y Summer: Y Fall: Y

**Plan admission types:**

Freshman: Y Transfer: Y Readmit: Y Graduate: N

Non Degree Certificate (UCRT only): N

Other (For Community Campus specifics): N

**Plan Taxonomy:** 30.0101, Biological and Physical Sciences.

Program Length Type: Program Length Value: 0.00

Report as NSC Program:

SULA Special Program:

**Print Option:**

Diploma: Y BA in Science

Transcript: Y BA in Science

**Conditions for Admission/Declaration for this Major:**

2.0 GPA

**Requirements for Accreditation:**

None

**Program Comparisons**

**University Appropriateness**

This proposed degree aligns with the UArizona strategic pillars:

1. Wildcat Journey, preparing students with the skills and mindsets to lead in the 4th Industrial Economy
2. Arizona Advantage, advancing our land grant mission to drive social, cultural, and economic impact

The proposed degree will add value to degrees in such fields as education, law, journalism, business, development, economics, management, humanities, etc.) so students in these fields are better prepared to apply their knowledge to the challenges of today. The degree thus prepares students with a foundation in science that will enable them to drive social, cultural, and economic change. Students will obtain an appreciation for scientific knowledge, laying a foundation for critical thinking. Additionally, understanding of science factors fundamentally into the background and mindset necessary for students to address challenges of the 4th Industrial Economy.

**Arizona University System**

NBR	PROGRAM	DEGREE	#STDNTS	LOCATION	ACCRDT
1	BIS- EmpSciTech HealthSociet y	BIS	56	UA	N
2	BA Appl Humanities- Medicine	BA	48	UA	N
3	BA Appl Humanities-	BA	1	UA	N

NBR	PROGRAM	DEGREE	#STDNTS	LOCATION	ACCRDT
	PH				

### Peer Comparison

The University of Arizona offers the following degrees with some similarity to the proposed BA in Science: the 1) Bachelor of Interdisciplinary Studies-Emphasis in Science, Technology, Health and Society, 2) BA in Applied Humanities-Medicine, 3) BA in Applied Humanities-Public Health. The main similarity with the Bachelor of Interdisciplinary Studies-Emphasis in Science, Technology, Health and Society and the proposed BA is that both degrees provide students with STEM instruction. The main differences are that students in the proposed BA take M-strand moderate math requiring precalculus whereas the BIS only requires G-strand general math. Additionally, students in the proposed BA obtain more extensive instruction in science through 100- and 200-level requirements and upper electives in science. The BAs in Applied Humanities also only require G-strand math and further require no science courses.

### Faculty & Resources

#### Faculty

Current Faculty:

INSTR ID	NAME	DEPT	RANK	DEGREE	FCLTY/%
04504139	Mary Peterson	0423	Professor	Doctor of Philosophy	.05
04709789	Sumitendra Mazumdar	0411	Professor	Doctor of Philosophy	.05
06605230	Joyce Schroeder	0417	Professor	Doctor of Philosophy	.05
12906053	Rebecca Gomez	0423	Professor	Doctor of Philosophy	.05
13300427	Craig Aspinwall	2536	Professor	Doctor of Philosophy	.05
13503529	Konrad Zinsmaier	2529	Professor	Doctor of Philosophy	.05
14107852	Michael Worobey	0420	Professor	Doctor of Philosophy	.05
15903042	Christopher Castro	0469	Professor	Doctor of Philosophy	.05

Additional Faculty:

None

Current Student & Faculty FTE

DEPARTMENT	UGRD HEAD COUNT	GRAD HEAD COUNT	FACULTY FTE
SCNC	7908	882	65.00

## Projected Student & Faculty FTE

	UGRD HEAD COUNT			GRAD HEAD COUNT			FACULTY FTE		
DEPT	YR 1	YR 2	YR 3	YR 1	YR 2	YR 3	YR 1	YR 2	YR 3
0442	30	60	90	0	0	0	57.00	57.00	57.00

### Library

Acquisitions Needed:

None

### Physical Facilities & Equipment

Existing Physical Facilities:

None needed

Additional Facilities Required & Anticipated:

None

### Other Support

Other Support Currently Available:

Science Administration

Other Support Needed over the Next Three Years:

The proposed BA in Science requires no additional faculty or infrastructure but will require an advisor for student support and a program manager to administer the program. The associate dean for undergraduate student success in the college of science will oversee hiring these personnel.

### Comments During Approval Process

1/20/2023 4:29 PM

MELANIECMADDEN

Comments
Approved.



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

*To be used once the preliminary proposal has been approved.*

I. MAJOR REQUIREMENTS–

UNDERGRADUATE

Total units required to complete the degree	120
Upper-division units required to complete the degree	42
Foundation courses	
<a href="#">Second language</a>	4th Semester Proficiency
<a href="#">Math</a>	Moderate: M-Strand
<a href="#">General education requirements</a>	<p>Entry course/1 unit – UNIV 101</p> <p>4 courses/12 units: Exploring Perspectives (one course from each domain required)</p> <ul style="list-style-type: none"> <li>- Humanist</li> <li>- Artist</li> <li>- Social Scientist</li> <li>- Natural Scientist</li> </ul> <p>3 courses/9 units: Building Connections</p> <p>Exit course/1 unit – UNIV 301</p>
Pre-major? (Yes/No). If yes, provide requirements. Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department.	No
List any special requirements to declare or gain admission to this major (completion of specific coursework, minimum GPA, interview, application, etc.)	No special requirements
Major requirements	
Minimum # of units required in the major (units counting towards major units and major GPA)	42



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<p>Minimum # of upper-division units required in the major (upper division units counting towards major GPA)</p>	<p>16</p>
<p><a href="#">Minimum # of residency units to be completed in the major</a></p>	<p>18</p>
<p>Required supporting coursework (courses that do not count towards major units and major GPA but are required for the major). Courses listed must include prefix, number, units, and title. Include any limits/restrictions needed (house number limit, etc.).</p>	<p><b>Complete 1 of the following:</b></p> <ul style="list-style-type: none"> <li>-Math 113 (3) Elements of Calculus</li> <li>-Math 122A (1) Functions of Calculus &amp; Math 122B (4) First semester Calculus</li> <li>-Math 125 (3) Calculus</li> </ul>
<p>Major requirements. List all major requirements including core and electives. If applicable, list the emphasis requirements for each proposed emphasis*. Courses listed count towards major units and major GPA. Courses listed must include prefix, number, units, and title. Mark new coursework (New). Include any limits/restrictions needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department.</p>	<p style="text-align: center;"><u>Core Courses</u></p> <p style="text-align: center;"><b>Statistics Requirement. (3 units) Complete 1 of the following:</b></p> <ul style="list-style-type: none"> <li>-Math 163 or 263 (3) Basic Statistics or Intro to Statistics and Biostatistics</li> <li>-PSY 230 (3) Psychological Measurement and Statistics</li> </ul> <p style="text-align: center;"><b>Core Science Requirement. (16 units) Complete 4 of the following (complete at least one course from each of biology, chemistry, and physics):</b></p> <ul style="list-style-type: none"> <li>-MCB 181 R/L (4) Introductory Biology I with lab</li> <li>-ECOL 182 R/L (4) Introductory Biology 2 with lab</li> <li>-CHEM 141 &amp; 145 (4) General Chemistry 1: Quantitative Approach with lab</li> <li>-CHEM 142 &amp; 146 (4) General Chemistry 2: Quantitative Approach with lab</li> <li>-PHYS 102 &amp; 181 (4) Introductory Physics 1 with lab</li> <li>-PHYS 103 &amp; 182 (4) Introductory Physics 2 with lab</li> </ul> <p style="text-align: center;">Or</p> <ul style="list-style-type: none"> <li>-PHYS 141 (4) Introductory Mechanics</li> <li>-PHYS 241 (4) Introductory Electricity and Magnetism</li> <li>-PHYS 242 (4) Introductory Relativity and Quantum Mechanics</li> </ul> <p style="text-align: center;"><b>Additional Science Requirement (7 units). Complete 2 of the following:</b></p> <ul style="list-style-type: none"> <li>-NSCS 200 (3) Fundamentals of Neuroscience &amp; Cognitive Science</li> <li>-PSY 101 (4) Introduction to Psychology</li> </ul>



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	<p style="text-align: center;"><b>Capstone Requirement (1 unit)</b></p> <p>-SCI 401 (1) Science Capstone</p> <p style="text-align: center;"><b><u>Upper division electives (15 units)</u></b></p> <p>Students take at least 3 courses in one area and the remaining 2 courses from any of those listed below for a total of 5 upper division electives. Example areas are listed below. An area may also be a grouping of classes from a single STEM department.</p> <p><b>Psychology</b></p> <ul style="list-style-type: none"><li>-PSY 300 (3) Cognitive Neuroscience: A Guide to Mind and Brain</li><li>-PSY 340 (3) Introduction to Cognitive Development</li><li>-PSY 352 (3) Personality</li><li>-PSY 360 (3) Social Psychology</li><li>-PSY 381 (3) Abnormal Psychology</li><li>-PSY 383 (3) Health Psychology</li><li>-PSY 324 (3) Fundamentals of Aging</li><li>-PSY 412 (3) Animal Learning</li><li>-PSY 480 (3) Forensic Psychology</li></ul> <p><b>Earth Systems and Sustainability</b></p> <ul style="list-style-type: none"><li>-ATMO 336 (3) Weather, Climate, and Society</li><li>-HWRS 349A (3) Principals of Hydrology</li><li>-HWRS 349B (3) Principals of Hydrology Lab</li><li>-ATMO 436A (3) Weather Fundamentals</li></ul> <p><b>Genetics, Cell, and Molecular Biology</b></p> <ul style="list-style-type: none"><li>-ECOL 320 (4) Genetics</li><li>-ECOL 326 (3) Genomics</li><li>-MCB 404 (3) Bioethics</li><li>-MCB 410 (3) Cell Biology</li><li>-MCB 411 (3) Molecular Biology</li><li>-MCB 422 (3) Problem Solving with Genetic Tools</li></ul>
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	<p><b>Ecology, Evolution, and Animal Behavior</b></p> <ul style="list-style-type: none"> <li>-ECOL 406R (3) Conservation Biology</li> <li>-ECOL 437 (4) Vertebrate Physiology</li> <li>-ECOL 485 (4) Mammalogy</li> <li>-ECOL 487R (3) Animal Behavior</li> <li>-ECOL 487L (1) Animal Behavior Lab</li> <li>-ECOL 488 (4) Arizona Mammals</li> </ul> <p><b>Biochemistry</b></p> <ul style="list-style-type: none"> <li>~CHEM 241A (3) Organic Chemistry Lecture I</li> <li>-CHEM 241B (3) Organic Chemistry Lecture 2</li> <li>-BIOC 384 (3) Foundations in Biochemistry</li> <li>-BIOC 385 (3) Metabolic Biochemistry</li> <li>(~required for the remaining 3 courses in this grouping)</li> </ul> <p><b>Neuroscience</b></p> <ul style="list-style-type: none"> <li>*NROS 307 (3) Cellular Neurophysiology</li> <li>*NROS 310 (3) Molecular and Cellular Biology of Neurons</li> <li>*NROS 418 (3) Fundamental Principles of systems Neuroscience</li> <li>-NROS 308 (3) Methods in Neuroscience</li> <li>-NROS 330 (3) Principles of Neuroanatomy: Cells to Systems</li> <li>-NROS 430 (3) Neurogenetics</li> <li>-NROS 440 (3) How to build a Brain: Mechanisms of Neural Development</li> <li>(*recommended courses)</li> </ul> <p><b>Cognitive Science</b></p> <ul style="list-style-type: none"> <li>-NSCS 320 (3) Issues and Themes in Cognitive Science</li> <li>-CGSC 344 (3) Modeling the Mind: Computational Models of Cognition</li> <li>-CGSC 310 (3) Multisensory Perception</li> <li>-PSY 300 (3) Cognitive Neuroscience: A Guide to Mind and Brain (note: students may count this course toward one grouping only)</li> </ul>
<p><b>Internship, practicum, applied course requirements (Yes/No). If yes, provide description.</b></p>	<p>No</p>
<p><b>Senior thesis or senior project required (Yes/No). If yes, provide description.</b></p>	<p>No</p>





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Additional requirements (provide description)	None
Minor (specify if optional or required)	None required
Any <a href="#">double-dipping restrictions</a> (Yes/No)? If yes, provide description.	Up to 9 units may double dip with general education requirements

CURRENT COURSES–

Course prefix and number (include cross-listings)	Units	Title	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Typically Offered (F, W, Sp, Su)	Dept signed party to proposal? (Yes/No)
MATH 263	3	Introduction to Statistics and Biostatistics	Placement or completion of MATH 108, 112, 113, 116, 119A, 122B, or 125 in the last year	Online	F,Sp,Su	Yes
PSY 230	3	Psychological Measurement and Statistics	PSY 101 or PSY 150A1	Online	F,Sp,Su	Yes
MCB 181R/L	4	Introductory Biology 1 with lab	placement	Online	F,Sp,Su	Yes
ECOL 182R/L	4	Introductory Biology 2 with lab	placement	Online	Fall (7W1 & 7W2), Spring (7W1 & 7W2), Summer (5W1 & 5W2)	Yes
CHEM 141	3	General Chemistry 1: Quantitative Approach	placement	Online	F,Su	Yes
CHEM 145	1	General Chemistry 1 Lab: Quantitative Approach	placement	Online	F,Su	Yes



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

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CHEM 142	3	General Chemistry 2: Quantitative Approach	CHEM 141	Online	Sp,Su	Yes
CHEM 146	1	General Chemistry 2 Lab: Quantitative Approach	CHEM 142	Online	Sp,Su	Yes
PHYS 102	3	Introductory Physics 1	placement	Online	F,Sp	Yes
PHYS 181	1	Introductory Physics 1 Lab	placement	Online	F,Sp	Yes
PHYS 103	3	Introductory Physics 2	PHYS 102	Online	F,Sp	Yes
PHYS 182	1	Introductory Physics 2 Lab	PHYS 181	Online	F,Sp	Yes
PHYS 141	4	Introductory Mechanics	Calc 1, concurrent enrollment in MATH 129	Online	F,Sp	Yes
PHYS 241	4	Introductory Electricity and Magnetism	PHYS 141, CR, MATH 223	Online	F,Sp	Yes
PHYS 242	3	Introductory Relativity and Quantum Mechanics	PHYS 141, PHYS 142, PHYS 241 or OPTI 226	Online	F,Sp	Yes
NSCS 200	3	Fundamentals of Neuroscience & Cognitive Science	MCB 181R and PSY 101 or equivalent	Online	F,Sp	Yes
PSY 101	4	Introduction to Psychology	None	Online	F,W,Sp, Su	Yes
PSY 300	3	Cognitive Neuroscience: A Guide to Mind and Brain	None	Online	F,W,Sp, Su	Yes
PSY 340	3	Introduction to Cognitive Development	PSY 101 or PSY 150A1	Online	F,Sp,Su	Yes
PSY 352	3	Personality	PSY 101 or PSY 150A1	Online	Sp,Su	Yes
PSY 360	3	Social Psychology	PSY 101 or PSY 150A1	Online	Fa,Su	Yes
PSY 381	3	Abnormal Psychology	PSY 101 or PSY 150A1	Online	Sp,Su	Yes
PSY 383	3	Health Psychology	PSY 101 or PSY 150A1	Online	Fa,Su	Yes
PSY 324	3	Fundamentals of aging	PSY 101 or PSY 150A1	Online	Fa	Yes
PSY 412	3	Animal Learning	PSY 101 or PSY 150A1	Online	Sp	Yes
PSY 480	3	Forensic Psychology	PSY 101 or PSY 150A1	Online	Sp	Yes
ATMO 336	3	Weather, Climate and Society	None	Online	Fa, Sp, Su	Yes
HWRS 349A	3	Principals of Hydrology	MATH 122B or MATH 125	Online	Fa	Yes
HWRS 349B	3	Principals of Hydrology Lab	MATH 122B or MATH 125. Have previously taken HWRS 249A or concurrent	Online	Fa	Yes



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

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			enrollment in HWRS 249A. Department permission required.			
ATMO 436A	3	Weather Fundamentals	MATH113 or MATH 122B and physics background (high school physics suffices)	Online	Sp	Yes
ECOL 320	4	Genetics	MCB 181R and MCB 181L or consent of instructor.	Online	Fall (7W1), Spring (7W1), Summer (5W1 & 5W2)	Yes
ECOL 326	3	Genomics	ECOL 182R and ECOL 182L	Online	Fall (7W2)	Yes
MCB 404	3	Bioethics	One year of college-level introductory biology; botany not acceptable.	Online	F,Sp,Su	Yes
MCB 410	3	Cell Biology	Not an MCB BS major. MCB 181R, MCB 181L, ECOL 182R, ECOL 182L.	Online	Fa,Su	Yes
MCB 411	3	Molecular Biology	Not an MCBBS major. Prerequisites MCB 181R, MCB 181L.	Online	Sp,Su	Yes
MCB 422	3	Problem Solving with Genetic Tools	MCB 181R and 181L.	Online	Su	Yes
ECOL 406R	3	Conservation Biology	ECOL 182R and ECOL 182L	Online	Summer (during 5W1 OR 5W2)	Yes
ECOL 437	4	Vertebrate Physiology	ECOL 182R and ECOL 182L	Online	Spring (7W1)	Yes
ECOL 485	4	Mammalogy	ECOL 182R and ECOL 182L	Online	Fall (7W2)	Yes
ECOL 487R	3	Animal Behavior	ECOL 182R and ECOL 182L	Online	Fall OR Spring (during 7W1 OR 7W2)	Yes
ECOL 487L	1	Animal Behavior Lab	ECOL 182R and ECOL 182L	Online	Fall OR Spring (during 7W1 OR 7W2)	Yes

ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

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ECOL 488	4	Arizona Mammals	ECOL 182R and ECOL 182L	Online	Summer (during 5W1 OR 5W2)	Yes
CHEM 241A	3	Organic Chemistry Lecture I	CHEM 105B, CHEM 142, CHEM 152 or CHEM 162.	Online	F,Su	Yes
BIOC 384	3	Foundations in Biochemistry	MCB 181R and (CHEM 142 or CHEM 152 or CHEM 105B or CHEM 162) and (CHEM 241A or CHEM 242A or CHEM 246A). BIOCBA and BIOCBS Students may not enroll.	Online	F,W,Sp,Su	Yes
BIOC 385	3	Metabolic Biochemistry	MCB 181R and (CHEM 142 or CHEM 152 or CHEM 105B or CHEM 162) and (CHEM 241A or CHEM 242A or CHEM 246A). BIOCBA and BIOCBS Students may not enroll.	Online	F,W,Sp,Su	Yes
CHEM 241B	3	Organic Chemistry Lecture II	CHEM 241A or CHEM 242A or CHEM 246A.	Online	F,Su	Yes
NROS 307	3	Cellular Neurophysiology	MCB181R , CHEM 151 with lab.	Online	F,Sp	Yes
NROS 308	3	Methods in Neuroscience	Prerequisite or concurrent enrollment in NSCS 307.	Online	F,Sp	Yes
NROS 310	3	Molecular and Cellular Biology of Neurons	NSCS 200	Online	F,Sp	Yes
NROS 418	3	Fundamental Principles of Systems Neuroscience	None	Online	F,Sp	Yes
NROS 330	3	Principles of Neuroanatomy: Cells to Systems	NSCS 200 and prerequisite or concurrent enrollment in NROS 307. Other courses may be accepted at the discretion of instructor.	online	F,Sp	Yes
NROS 430	3	Neurogenetics	MCB 181R (required), NROS 310 (recommended).	Online	F,Sp	Yes



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

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NROS 440	3	How to Build a Brain: Mechanisms of Neural Development	NSCS 200 (in progress OK)	Online	F,Sp	Yes
NSCS 320	3	Issues and Themes in Cognitive Science	NSCS 200	Online	Fa,Sp	Yes
CGSC 344	3	Modeling the Mind: Computational Models of Cognition	NSCS 200	Online	Fa,Sp	Yes
CGSC 310	3	Multisensory Perception	NSCS 200	Online	Su	Yes

II. NEW COURSES NEEDED

Course prefix and number (include cross-listings)	Units	Title	Pre-requisites	Modes of delivery (online, in-person, hybrid)	Status*	Anticipated first term offered	Typically Offered (F, W, Sp, Su)	Dept signed party to proposal? (Yes/No)	Faculty members available to teach the courses
SCI 401	1	Science Capstone	None	Online	D	Spring 2025	F, Sp	Yes	Yes

\*In development (D); submitted for approval (S); approved (A)

III. FACULTY INFORMATION

Faculty Member	Involvement	UA Vitae link or Box folder link
Associate Dean for Undergraduate Student Success, College of Science	Will oversee hiring of program manager for degree program	<a href="https://profiles.arizona.edu/person/rgomez">https://profiles.arizona.edu/person/rgomez</a>
Joyce Schroeder	Will oversee use and delivery of MCB courses	<a href="https://profiles.arizona.edu/person/joyces">https://profiles.arizona.edu/person/joyces</a>
Michael Worobey	Will oversee use and delivery of ECOL courses	<a href="https://profiles.arizona.edu/person/worobey">https://profiles.arizona.edu/person/worobey</a>



THE UNIVERSITY  
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ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

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Sumitendra Mazumdar	Will oversee use and delivery of Physics courses	<a href="https://profiles.arizona.edu/person/mazumdar">https://profiles.arizona.edu/person/mazumdar</a>
Lee Ryan	Will oversee use and delivery of psychology courses	<a href="https://profiles.arizona.edu/person/ryant">https://profiles.arizona.edu/person/ryant</a>
Christopher Castro	Will oversee use and delivery of HAS courses	<a href="https://profiles.arizona.edu/person/clcastro">https://profiles.arizona.edu/person/clcastro</a>
Craig Aspinwall	Will oversee use and delivery of chemistry and biochemistry courses	<a href="https://profiles.arizona.edu/person/aspinwal">https://profiles.arizona.edu/person/aspinwal</a>
Konrad Zinsmaier	Will oversee use and delivery of NROS courses and NSCS 200	<a href="https://profiles.arizona.edu/person/kez4">https://profiles.arizona.edu/person/kez4</a>
Mary Peterson	Will oversee use and delivery of CGSC courses	<a href="https://profiles.arizona.edu/person/mapeters">https://profiles.arizona.edu/person/mapeters</a>

IV. GRADUATION PLAN

Semester 1		Semester 2		Semester 3		Semester 4	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units
ENGL 101	3	ENGL 102	3	Semester 1 Language Requirement	4	Semester 2 Language Requirement	4
MATH 113	3	Statistics Requirement	3	Gen-Ed (EP Humanist)	3	NSCS 200	3
Gen-Ed (EP Artist)	3	Core Science Requirement with Lab II	4	Core Science Requirement with Lab III	4	Core Science Requirement with Lab IV	4
UNIV 101	1	Gen-Ed (EP Social Scientist)	3	PSY 101	4	Gen-Ed (EP Natural Scientist)	3
Core Science Requirement with Lab I	4	Non-major Lower Division Elective	3			Non-major Lower Division Elective	3
<b>Total</b>	14	<b>Total</b>	16	<b>Total</b>	15	<b>Total</b>	17

Semester 5		Semester 6		Semester 7		Semester 8	
Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units	Course prefix and number	Units



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GenEd Building Connections I	3	GenEd Building Connections II	3	GenEd Building Connections III	3	UNIV 301	1
Major Electives Group 1.1	3	Major Electives Group 1.2	3	Major Electives Group 1.3	3	Major Electives Group 1.4	3
Major Electives Group 2.1	3	Major Electives Group 2.2	3	Major Electives Group 2.3	3	Major Electives Group 2.4	3
Semester 3 Language Requirement	4	Semester 4 Language Requirement	4	Non-major Upper Division Elective	3	Non-major Upper Division Elective	3
Non-major Upper Division Elective	3	Non-major Upper Division Elective	3	Non-major Upper Division Elective	3	Non-major Upper Division Elective	3
						SCI 401	1
<b>Total</b>	16	<b>Total</b>	16	<b>Total</b>	15	<b>Total</b>	17



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- V. **Curriculum Map and Assessment Map** - Complete this table as a summary of your learning outcomes and assessment plan, using these examples as a model. If you need assistance completing this table and/or the Curriculum Map, please contact the [Office of Instruction and Assessment](#). Attach your Curriculum Map here.

Program: BA Science

<b>Learning Outcome #1:</b> Demonstrate foundational knowledge of the discipline (Basic Knowledge).
<b>Concepts:</b> core knowledge of the discipline
<b>Competencies:</b> Students will demonstrate understanding of the theories, fundamental principles, and concepts of the discipline.
<b>Assessment Methods:</b> This outcome will be assessed in participation in online discussions, exams, assigned readings, and discussion questions.
<b>Measures:</b> Direct measures include evaluation of homework, exams, papers, reports, or other student projects. Indirect measures will include student self-assessments via surveys and reflections
<b>Learning Outcome #2:</b> Apply modern and/or relevant laboratory skills and protocols to collect and analyze data (Laboratory Skills).
<b>Concepts:</b> laboratory skills and protocols for collecting and analyzing data
<b>Competencies:</b> Students will use quantitative skills to 1) collect data using the tools of the discipline and 2) analyze the data.
<b>Assessment Methods:</b> This outcome will be assessed across several different laboratories the student takes.
<b>Measures:</b> Direct measures include Instructor grading of lab reports. Indirect measures will include student self-assessments via surveys and reflections
<b>Learning Outcome #3:</b> Communicate knowledge, ideas, and reasoning clearly, effectively, and objectively in written and oral forms (Communication Skills).
<b>Concepts:</b> communicate effectively, reason clearly, write and communicate objectively
<b>Competencies:</b> Students will demonstrate their knowledge through oral and written work
<b>Assessment Methods:</b> This outcome will be assessed using oral presentations and/or written papers in the capstone course
<b>Measures:</b> Direct measures include instructor grading of written and oral work. Indirect measures will include student self-assessments via surveys and reflections
<b>Learning Outcome #4:</b> Interpret data using scientific reasoning and foundational disciplinary knowledge through project-based activities and/or research projects (Scientific Reasoning and Research).
<b>Concepts:</b> basic experimental manipulations, analysis of data, implications of the experimental outcomes
<b>Competencies:</b> Students will demonstrate their ability to apply experimental methods and interpret data.
<b>Assessment Methods:</b> This outcome will be assessed in participation in online discussions, exams, lab reports, and discussion questions.
<b>Measures:</b> Direct measures include evaluation of student written work, project-based activities, or research projects. Indirect measures will include student self-assessments via surveys and reflections





ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

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<b>Learning Outcome #5:</b> Demonstrate teamwork skills by collaborating and participating with peers to produce various deliverables (e.g., data collection, data analysis, conclusions) (Teamwork).
<b>Concepts:</b> collaborative work, mutual respect, and shared values.
<b>Competencies:</b> Students will demonstrate the ability to work effectively in virtual teams by demonstrating mastery of professional skills including content knowledge, self-reflection, project-management, and teamwork.
<b>Assessment Methods:</b> This outcome will be assessed in classroom interaction, homework, or group projects.
<b>Measures:</b> Direct measures include grades of student contribution to a project. Indirect measures will include student self-assessments via surveys and reflections

VII. PROGRAM ASSESSMENT PLAN-

Assessment Measure	Source(s) of Evidence	Data Collection Point(s)
Job Placement Statistics	Student/Alumni Survey	At graduation annually (senior exit survey)
SCI 401 Senior Capstone	Percentage of students meeting the acceptable target for each learning objective measured using class assignments, reflections, presentations, and reports	Annually
Senior Exit Survey (will measure percentage of students rating each learning outcome at “Agree” or “Strongly Agree”	Student Survey	At graduation annually

VIII. ANTICIPATED STUDENT ENROLLMENT-complete the table below. What concrete evidence/data was used to arrive at the numbers?

5-YEAR PROJECTED ANNUAL ENROLLMENT					
	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year
Number of Students	30	60	90	120	150



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ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

*To be used once the preliminary proposal has been approved.*

Data/evidence used to determine projected enrollment numbers:

We used enrollment rates in two comparable programs at peer institutions to anticipate program enrollment. The table below shows the total enrollment in these programs. We extrapolated a conservative value in line with the program at the University of Oregon established several years ago:

Summary of enrollments in two comparable programs at peer institutions			
University	Type of Degree	Degree Name	Total Enrollment (2022)
University of Arizona	BIS	Bachelor of Interdisciplinary Studies—Emphasis in Science, Technology, Health and Society	56
University of Arizona	BA	BA in Applied Humanities—Medicine	48
University of Arizona	BA	BA in Applied Humanities—Public Health	1

**IX. ANTICIPATED DEGREES AWARDED-**

PROJECTED DEGREES AWARDED ANNUALLY					
	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year
Number of Degrees	0	9	18	27	36

Data/evidence used to determine number of anticipated degrees awarded annually: We calculated a 60% graduation rate based on comparisons to similar programs at peer institutions. We also factored in students transferring into AZ Online and into the major.

**X. PROGRAM DEVELOPMENT TIMELINE-** describe plans and timelines for 1) marketing the major and 2) student recruitment activities.



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OF ARIZONA

## ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

*To be used once the preliminary proposal has been approved.*

All programs required for the major are already developed and delivered via AZ Online. Thus, we will not need time to develop new courses. We will work closely with the recruitment and marketing teams at Arizona Online to market the program through their marketing channels as soon as ABOR approves the degree program.

- XI. **Program Fees and Differential Tuition (PFDT) Request** – For implementation of fees, you must work with [University Fees](#). The annual deadline is December 1. For any questions, please contact the [University Fees Program Manager](#).

We do not plan to propose any program fees associated with any new courses for the BA in Science program.



## ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

*To be used once the preliminary proposal has been approved.*

### Appendix C. ABOR Form

#### Request to Establish New Academic Program in Arizona

Please complete all fields. Boxes may be expanded to accommodate longer responses. Clarifying field descriptions can be found below. Should you have any questions or concerns, please email Helen Baxendale, Director of Academic Affairs and Policy at [helen.baxendale@azregents.edu](mailto:helen.baxendale@azregents.edu)

**University:** University of Arizona

<b>Name of Proposed Academic Program:</b> Bachelor of Arts in Science
<b>Academic Department:</b> College of Science—SCNC.
<b>Geographic Site:</b> Arizona Online
<b>Instructional Modality:</b> online/ONLN campus
<b>Total Credit Hours:</b> 120
<b>Proposed Inception Term:</b> Fall 2023
<b>Brief Program Description:</b> The B.A. in Science meets the needs of students in our AZ Online programs who wish to pair their degrees with basic training and skills in STEM. This interdisciplinary degree program emphasizing biological and physical sciences will enhance job opportunities for students with a strong interest in science who do not anticipate working as a professional scientist, but instead intend to use their knowledge in an intersectional field such as education, policy, law, or education. It will also provide basic STEM background for medical and health services managers, medical assistants, natural



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

*To be used once the preliminary proposal has been approved.*

sciences managers, and entry level science technicians. This degree will prepare students with a foundation in science that will enable them to drive social, cultural, and economic change.

This proposed degree aligns with the UArizona strategic pillars:

1. Wildcat Journey, preparing students with the skills and mindsets to lead in the 4th Industrial Economy
2. Arizona Advantage, advancing our land grant mission to drive social, cultural, and economic impact

The proposed degree will add value to degrees in such fields as education, law, journalism, business, development, economics, management, humanities, etc.) so students in these fields are better prepared to apply their knowledge to the challenges of today. The degree thus prepares students with a foundation in science that will enable them to drive social, cultural, and economic change. Students will obtain an appreciation for scientific knowledge, laying a foundation for critical thinking. Additionally, understanding of science factors fundamentally into the background and mindset necessary for students to address challenges of the 4th Industrial Economy.

**Learning Outcomes and Assessment Plan:**

**Program:** BA Science

**Learning Outcome #1:** Demonstrate foundational knowledge of the discipline (Basic Knowledge).

**Concepts:** core knowledge of the discipline

**Competencies:** Students will demonstrate understanding of the theories, fundamental principles, and concepts of the discipline.

**Assessment Methods:** This outcome will be assessed in participation in online discussions, exams, assigned readings, and discussion questions.

**Measures:** Direct measures include evaluation of homework, exams, papers, reports, or other student projects. Indirect measures will include student self-assessments via surveys and reflections

**Learning Outcome #2:** Apply modern and/or relevant laboratory skills and protocols to collect and analyze data (Laboratory Skills).

**Concepts:** laboratory skills and protocols for collecting and analyzing data

**Competencies:** Students will use quantitative skills to 1) collect data using the tools of the discipline and 2) analyze the data.

**Assessment Methods:** This outcome will be assessed across several different laboratories the student takes.

**Measures:** Direct measures include Instructor grading of lab reports. Indirect measures will include student self-assessments via surveys and reflections

**Learning Outcome #3:** Communicate knowledge, ideas, and reasoning clearly, effectively, and objectively in written and oral forms (Communication Skills).



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

*To be used once the preliminary proposal has been approved.*

<b>Concepts:</b> communicate effectively, reason clearly, write and communicate objectively
<b>Competencies:</b> Students will demonstrate their knowledge through oral and written work
<b>Assessment Methods:</b> This outcome will be assessed using oral presentations and/or written papers in the capstone course
<b>Measures:</b> Direct measures include instructor grading of written and oral work. Indirect measures will include student self-assessments via surveys and reflections
<b>Learning Outcome #4:</b> Interpret data using scientific reasoning and foundational disciplinary knowledge through project-based activities and/or research projects (Scientific Reasoning and Research).
<b>Concepts:</b> basic experimental manipulations, analysis of data, implications of the experimental outcomes
<b>Competencies:</b> Students will demonstrate their ability to apply experimental methods and interpret data.
<b>Assessment Methods:</b> This outcome will be assessed in participation in online discussions, exams, lab reports, and discussion questions.
<b>Measures:</b> Direct measures include evaluation of student written work, project-based activities, or research projects. Indirect measures will include student self-assessments via surveys and reflections
<b>Learning Outcome #5:</b> Demonstrate teamwork skills by collaborating and participating with peers to produce various deliverables (e.g., data collection, data analysis, conclusions) (Teamwork).
<b>Concepts:</b> collaborative work, mutual respect, and shared values.
<b>Competencies:</b> Students will demonstrate the ability to work effectively in virtual teams by demonstrating mastery of professional skills including content knowledge, self-reflection, project-management, and teamwork.
<b>Assessment Methods:</b> This outcome will be assessed in classroom interaction, homework, or group projects.
<b>Measures:</b> Direct measures include grades of student contribution to a project. Indirect measures will include student self-assessments via surveys and reflections

Assessment Measure	Source(s) of Evidence	Data Collection Point(s)
Job Placement Statistics	Student/Alumni Survey	At graduation annually (senior exit survey)
SCI 401 Senior Capstone	Percentage of students meeting the acceptable target for each learning objective measured using class assignments, reflections, presentations, and reports	Annually
Senior Exit Survey (will measure percentage of students rating each learning outcome at “Agree” or “Strongly Agree”	Student Survey	At graduation annually



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

To be used once the preliminary proposal has been approved.

**Projected Enrollment for the First Three Years:**

5-YEAR PROJECTED ANNUAL ENROLLMENT					
	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year
Number of Students	30	60	90	120	150

**Evidence of Market Demand:**

The data are from a Lightcast Q3 2022 Data Set provided by AZ Online and a Burning Glass report provided by Curricular Affairs. For students based in the U.S., the marketing report for CIP code 30.010 lists job growth expected over 10 years ranging from 3.89% (biological technicians) to 40.85% (medical and health services managers) with job growth expected for secondary school teachers (13.49%), medical assistants (21.14%), Industrial Production managers (11.17%) and natural sciences managers (5.14%) also.

Additionally, Arizona Global, who will eventually be added as a campus has expressed market demand for this degree.

**Similar Programs Offered at Arizona Public Universities:** The University of Arizona offers the following degrees with some similarity to the proposed BA in Science: the 1) Bachelor of Interdisciplinary Studies—Emphasis in Science, Technology, Health and Society, 2) BA in Applied Humanities—Medicine, 3) BA in Applied Humanities—Public Health. The main similarity with the Bachelor of Interdisciplinary Studies—Emphasis in Science, Technology, Health and Society and the proposed BA is that both degrees provide students with STEM instruction. The main differences are that students in the proposed BA take M-strand moderate math requiring precalculus whereas the BIS only requires G-strand general math. Additionally, students in the proposed BA obtain more extensive instruction in science through 100- and 200-level requirements and upper electives in science. The BAs in Applied Humanities also only require G-strand math and further require no science courses.

**FOR CURRICULAR AFFAIRS USE ONLY**

**Objection(s) Raised by Another Arizona Public University?** YES NO

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e., faculty and administrative positions; infrastructure, etc.):**



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## ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

*To be used once the preliminary proposal has been approved.*

The proposed BA in Science requires no additional faculty or infrastructure but will require an advisor for student support and a program manager to administer the program. The associate dean for undergraduate student success in the college of science will oversee hiring these personnel.

Plan to Request Program Fee/Differentiated Tuition? NO

Estimated Amount: N/A

Program Fee Justification: N/A

Specialized Accreditation? NO

Accreditor: N/A





BUDGET PROJECTION FORM

Name of Proposed Program or Unit: BA in Science

	Projected		
Budget Contact Person: Kelly Grimm, Assistant Dean of Finance, COS	1st Year 2023 - 2024	2nd Year 2024 - 2025	3rd Year 2025 - 2026
<b>METRICS</b>			
Net increase in annual college enrollment UG	30	60	90
Net increase in college SCH UG	390	825	1,201
Net increase in annual college enrollment Grad	-	-	-
Net increase in college SCH Grad	-	-	-
Number of enrollments being charged a Program Fee	-	-	-
New Sponsored Activity (MTDC)	-	-	-
Number of Faculty FTE	-	-	-
<b>FUNDING SOURCES</b>			
<u>Continuing Sources</u>			
UG AIB Revenue	107,700	231,360	344,095
Grad AIB Revenue	-	-	-
Program Fee Revenue (net of revenue sharing)	-	-	-
F and A AIB Revenues	-	-	-
Reallocation from existing College funds (attach description)			
Other Items (attach description)			
<b>Total Continuing</b>	<b>\$ 107,700</b>	<b>\$ 231,360</b>	<b>\$ 344,095</b>
<u>One-time Sources</u>			
College fund balances			
Institutional Strategic Investment			
Gift Funding			
Other Items (attach description)			
<b>Total One-time</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>TOTAL SOURCES</b>	<b>\$ 107,700</b>	<b>\$ 231,360</b>	<b>\$ 344,095</b>
<b>EXPENDITURE ITEMS</b>			
<u>Continuing Expenditures</u>			
Faculty			
Other Personnel	95,025	98,826	102,779
Employee Related Expense	30,408	31,229	32,889
Graduate Assistantships			
Other Graduate Aid			
Operations (materials, supplies, phones, etc.)			
Additional Space Cost			
Other Items (attach description)			
<b>Total Continuing</b>	<b>\$ 125,433</b>	<b>\$ 130,055</b>	<b>\$ 135,668</b>
<u>One-time Expenditures</u>			
Construction or Renovation			
Start-up Equipment			
Replace Equipment			
Library Resources			
Other Items (attach description)			
<b>Total One-time</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>TOTAL EXPENDITURES</b>	<b>\$ 125,433</b>	<b>\$ 130,055</b>	<b>\$ 135,668</b>
<b>Net Projected Fiscal Effect</b>	<b>\$ (17,733)</b>	<b>\$ 101,305</b>	<b>\$ 208,427</b>

## **New Academic Program Budget Projection Form Justification**

The program funding projection for the BA in Science includes three years of budget projection information related to the new major.

### **Metrics**

We calculated the total number of SCH and enrollments (majors) we expect the program to generate each year for the college reflecting a net increase to the college. We also considered students transferring in from community colleges and SCH or enrollment within the college for students who might transfer to the new major. Our formulas per year reflect projected increases in the AIB model provided by the university.

As all courses are already delivered online. We do not anticipate needing to hire additional Faculty FTE needed for the major given minimal impact on any one course given the flexibility for course choice and the many courses available to students.

### **Funding Sources**

Funding sources related to SCH and enrollments stem from the net new activity described in the metrics section above. No one-time funds are needed or funds from Reallocation of existing sources or Other Items sources.

No Institutional Strategic Investment funds are needed.

### **Expenditure Items**

We budget the cost of an advisor to provide support for students and a program manager to administer the program factoring in annual raises. No other marginal costs, GA Assistantships or other expenditures related to the new program are expected (see information above).



**New Academic Program  
PEER COMPARISON**

Program name, degree, and institution	Proposed UA Program BA in Science	<a href="#"><u>Bachelor of Interdisciplinary Studies- Emphasis in Science, Technology, Health and Society</u></a> University of Arizona	BA in Applied Humanities <a href="#"><u>Medicine</u></a> University of Arizona	BA in Applied Humanities <a href="#"><u>Public Health</u></a> University of Arizona
Current number of students enrolled		56	48	1
Program Description	This degree provides basic instruction in the core sciences including biology, chemistry, and physics and breadth in upper division coursework requiring students to select 4 classes from one of several STEM areas associated with the major and 4 additional courses from any of the STEM areas. Students will gain breadth and depth in areas of science of their choosing ranging from neuroscience, earth systems and sustainability, and	This emphasis within the Bachelor of Integrated Studies program requires students to take courses from at least two disciplines to develop awareness of methods and limits of scientific inquiry and skill in quantitative analysis and deductive reasoning. Each student completes concentrations in three of seven themes and additional courses in the Science, Technology, Health, and Society track.	This degree provides students a broad curriculum designed to prepare them to steward the wellbeing of individuals and communities. In addition to courses in applied humanities students take courses in clinical reasoning, being a healthcare professional, careers in the health sciences, wellbeing for the healthcare professional, conversations in patient care, public health, and medical ethics.	This degree provides students a broad curriculum designed to design and implement evidence-based, culturally appropriate, and sustainable solutions to address health challenges and inequities in their communities. In addition to courses in applied humanities students take courses in public health, epidemiology, health education and health promotion, health disparities, and world food and health.

	genetics, cell, and molecular biology, and more.			
Target Careers	K-12 education, policy, law, medical and health services managers, medical assistants, natural sciences managers, entry level research technicians	Careers in research, information technology, the biotechnology industry, municipal development, and others	Medical assistants, medical technicians, medical and health service managers, careers in the health sciences	Careers in public health
Emphases? (Yes/No) List, if applicable	No	No	No	No
Minimum # of units required	120	120	120	120
Level of Math required (if applicable)	M-Strand (Moderate): Requires Precalculus and statistics	G-Strand (general knowledge)	G-Strand (general knowledge)	G-Strand (general knowledge)
Level of Second Language required (if applicable)	4 <sup>th</sup> semester proficiency	4 <sup>th</sup> semester proficiency	4 <sup>th</sup> semester proficiency	4 <sup>th</sup> semester proficiency
Pre-Major? (Yes/No) If yes, provide requirements.	No	No	No	No
Special requirements to declare/gain admission? (i.e. pre-requisites, GPA, application, etc.)	2.0 GPA	2.0 GPA	2.0 GPA	2.0 GPA
Internship, practicum, or applied/experiential requirements? If yes, describe.	No	No	No	No

Additional questions:

1. How does the proposed program align with peer programs? Briefly summarize the similarities between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

The main similarity with the Bachelor of Interdisciplinary Studies—Emphasis in Science, Technology, Health and Society and the proposed BA is that both degrees provide students with STEM instruction. The proposed degree shares less similarity with the other two degrees.

2. How does the proposed program stand out or differ from peer programs? Briefly summarize the differences between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

The main differences in the proposed and existing degrees are that students in the proposed BA take M-strand moderate math requiring precalculus whereas the BIS only requires G-strand general math as do the Bachelors in the Applied Humanities. Additionally, students in the proposed BA obtain more extensive instruction in science through 100- and 200-level requirements and upper electives in science. The BAs in Applied Humanities also only require G-strand math and do not require science courses.

3. How do these differences make this program more applicable to the target student population and/or a better fit for the University of Arizona?

This degree in leaving 25-50 elective units open will allow maximum flexibility for students pursuing degrees that require knowledge of science, but do not require students to conduct science (e.g., education, law, journalism, business, economics, humanities, etc.) adding value to such degrees so that students are better prepared to apply their knowledge to the challenges of today.

**Subject:** Re: Approval for courses used in the proposed BA/BS in Science  
**Date:** Friday, January 20, 2023 at 10:15:02 AM Mountain Standard Time  
**From:** Castro, Christopher L - (clcastro)  
**To:** Zinsmaier, Konrad E - (kez4), Gomez, Rebecca L - (rgomez)  
**CC:** Doug Ulmer, Ryan, Lee - (ryant), Schroeder, Joyce A - (joyces), Worobey, Michael - (worobey), Aspinwall, Craig A - (aspinwal), Peterson, Mary A - (mapeters)

Approved.

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Christopher L. Castro, Ph.D.  
Professor and Interim Head  
Department of Hydrology and Atmospheric Sciences  
University of Arizona  
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E-mail: clcastro@email.arizona.edu  
Web page: [www.atmo.arizona.edu/personalpages/castro/castro.htm](http://www.atmo.arizona.edu/personalpages/castro/castro.htm)  
Twitter: @CLCastro1974

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**From:** Zinsmaier, Konrad E - (kez4) <kez4@arizona.edu>  
**Sent:** Friday, January 20, 2023 10:13 AM  
**To:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>  
**Cc:** Doug Ulmer <ulmer@math.arizona.edu>; Ryan, Lee - (ryant) <ryant@arizona.edu>; Schroeder, Joyce A - (joyces) <joyces@arizona.edu>; Worobey, Michael - (worobey) <worobey@arizona.edu>; Aspinwall, Craig A - (aspinwal) <aspinwal@arizona.edu>; Castro, Christopher L - (clcastro) <clcastro@arizona.edu>; Peterson, Mary A - (mapeters) <mapeters@arizona.edu>  
**Subject:** Re: Approval for courses used in the proposed BA/BS in Science

Approved.

Konrad E. Zinsmaier, Ph.D.  
Professor of Neuroscience and Molecular & Cellular Biology  
Head, Department of Neuroscience  
University of Arizona  
Department of Neuroscience  
Gould-Simpson Building 627  
P.O. Box 210077  
1040 E. 4th Street  
Tucson, AZ 85721-0077

phone: 520-626-1343  
fax: 520-621-8282

On Jan 19, 2023, at 7:05 PM, Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu> wrote:

Dear Doug, Lee, Joyce, Mike, Craig, Konrad, Chris, and Mary,

I am writing to obtain your approval to use the courses listed below from your departments in the proposed BS and BA in Science. The degrees will be offered in the online campus. Please respond to this email message and copy all. Please contact me directly on a different email thread with any questions.

Rebecca

- Math 122A (3) Functions of Calculus & Math 122B (3) First semester Calculus
- Math 125 (3) Calculus
- Math 113 (3) Elements of Calculus

**Statistics Requirement. (3 units) Complete 1 of the following:**

- Math 163 or 263 (3) Basic Statistics or Intro to Statistics and Biostatistics
- PSY 230 (3) Psychological Measurement and Statistics

**Core Science Requirement. (16 units) Complete 4 of the following (complete at least one course from each of biology, chemistry, and physics):**

- MCB 181 R/L (4) Introductory Biology I with lab
- ECOL 182 R/L (4) Introductory Biology 2 with lab
- CHEM 141 & 145 (4) General Chemistry 1: Quantitative Approach with lab
- CHEM 142 & 146 (4) General Chemistry 2: Quantitative Approach with lab
- PHYS 102 & 181 (4) Introductory Physics 1 with lab
- PHYS 103 & 182 (4) Introductory Physics 2 with lab
- Or
- PHYS 141 (4) Introductory Mechanics
- PHYS 241 (4) Introductory Electricity and Magnetism
- PHYS 242 (4) Introductory Relativity and Quantum Mechanics

**Additional Science Requirement (7 units). Complete 2 of the following:**

- NSCS 200 (3) Fundamentals of Neuroscience & Cognitive Science
- PSY 101 (4) Introduction to Psychology

**Capstone Requirement (1 unit)**

- SCI 401 (1) Science Capstone

**Upper division electives (24 units)**

**Students take at least 4 courses in one area and the remaining 4 courses from any of those listed below for a total of 8 upper division electives. Example areas are listed below. An area may also be a grouping of classes from a single STEM department.**

**Psychology**

- PSY 300 (3) Cognitive Neuroscience: A Guide to Mind and Brain
- PSY 340 (3) Introduction to Cognitive Development
- PSY 352 (3) Personality
- PSY 300 (3) Social Development

- PSY 360 (3) Social Psychology
- PSY 381 (3) Abnormal Psychology
- PSY 383 (3) Health Psychology
- PSY 324 (3) Fundamentals of Aging
- PSY 412 (3) Animal Learning
- PSY 480 (3) Forensic Psychology

### **Earth Systems and Sustainability**

- ATMO 336 (3) Weather, Climate, and Society
- HWRS 349A (3) Principals of Hydrology
- HWRS 349B (3) Principals of Hydrology Lab
- ATMO 436A (3) Weather Fundamentals

### **Genetics, Cell, and Molecular Biology**

- ECOL 320 (4) Genetics
- ECOL 326 (3) Genomics
- MCB 404 (3) Bioethics
- MCB 410 (3) Cell Biology
- MCB 411 (3) Molecular Biology
- MCB 422 (3) Problem Solving with Genetic Tools

### **Ecology, Evolution, and Animal Behavior**

- ECOL 406R (3) Conservation Biology
- ECOL 437 (4) Vertebrate Physiology
- ECOL 485 (4) Mammalogy
- ECOL 487R (3) Animal Behavior
- ECOL 487L (1) Animal Behavior Lab
- ECOL 488 (4) Arizona Mammals

### **Biochemistry**

- ~CHEM 241A (3) Organic Chemistry Lecture 1
  - CHEM 241B (3) Organic Chemistry Lecture 2
  - BIOC 384 (3) Foundations in Biochemistry
  - BIOC 385 (3) Metabolic Biochemistry
- (~required for the remaining 3 courses in this grouping)

### **Neuroscience**

- \*NROS 307 (3) Cellular Neurophysiology
  - \*NROS 310 (3) Molecular and Cellular Biology of Neurons
  - \*NROS 418 (3) Fundamental Principles of systems Neuroscience
  - NROS 308 (3) Methods in Neuroscience
  - NROS 330 (3) Principles of Neuroanatomy: Cells to Systems
  - NROS 430 (3) Neurogenetics
  - NROS 440 (3) How to build a Brain: Mechanisms of Neural Development
- (\*recommended courses)

### **Cognitive Science**

- NSCS 320 (3) Issues and Themes in Cognitive Science
- CGSC 344 (3) Modeling the Mind: Computational Models of Cognition
- CGSC 310 (3) Multisensory Perception
- PSY 300 (3) Cognitive Neuroscience: A Guide to Mind and Brain (note: students may count this course toward one grouping only)

<image001.png>

### **Rebecca Gómez, PhD (She/Her/Ella)**

Associate Dean for Undergraduate Student Success  
College of Science  
Professor of Psychology and Cognitive Science



Gould-Simpson 1025  
PO Box 210077 | Tucson, AZ 85721  
[rgomez@arizona.edu](mailto:rgomez@arizona.edu)

LAND ACKNOWLEDGEMENT: We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.

[<image002.png>](#)

**Subject:** Re: Approval for courses used in the proposed BA/BS in Science  
**Date:** Friday, January 20, 2023 at 7:39:45 AM Mountain Standard Time  
**From:** Doug Ulmer  
**To:** Ryan, Lee - (ryant)  
**CC:** Schroeder, Joyce A - (joyces), Gomez, Rebecca L - (rgomez), Worobey, Michael - (worobey), Aspinwall, Craig A - (aspinwal), Zinsmaier, Konrad E - (kez4), Castro, Christopher L - (clcastro), Peterson, Mary A - (mapeters)

I approve as well. -Doug

On Jan 20, 2023, at 6:29 AM, Ryan, Lee - (ryant) <[ryant@arizona.edu](mailto:ryant@arizona.edu)> wrote:

I approve.  
Lee

Sent from Lee's smartphone

---

**From:** Schroeder, Joyce A - (joyces) <[joyces@arizona.edu](mailto:joyces@arizona.edu)>  
**Sent:** Thursday, January 19, 2023 8:11:35 PM  
**To:** Gomez, Rebecca L - (rgomez) <[rgomez@arizona.edu](mailto:rgomez@arizona.edu)>; Doug Ulmer <[ulmer@math.arizona.edu](mailto:ulmer@math.arizona.edu)>; Ryan, Lee - (ryant) <[ryant@arizona.edu](mailto:ryant@arizona.edu)>; Worobey, Michael - (worobey) <[worobey@arizona.edu](mailto:worobey@arizona.edu)>; Aspinwall, Craig A - (aspinwal) <[aspinwal@arizona.edu](mailto:aspinwal@arizona.edu)>; Zinsmaier, Konrad E - (kez4) <[kez4@arizona.edu](mailto:kez4@arizona.edu)>; Castro, Christopher L - (clcastro) <[clcastro@arizona.edu](mailto:clcastro@arizona.edu)>; Peterson, Mary A - (mapeters) <[mapeters@arizona.edu](mailto:mapeters@arizona.edu)>  
**Cc:** Gomez, Rebecca L - (rgomez) <[rgomez@arizona.edu](mailto:rgomez@arizona.edu)>  
**Subject:** Re: Approval for courses used in the proposed BA/BS in Science

Approved

Joyce

---

**From:** Gomez, Rebecca L - (rgomez) <[rgomez@arizona.edu](mailto:rgomez@arizona.edu)>  
**Sent:** Thursday, January 19, 2023 7:05:33 PM  
**To:** Doug Ulmer <[ulmer@math.arizona.edu](mailto:ulmer@math.arizona.edu)>; Ryan, Lee - (ryant) <[ryant@arizona.edu](mailto:ryant@arizona.edu)>; Schroeder, Joyce A - (joyces) <[joyces@arizona.edu](mailto:joyces@arizona.edu)>; Worobey, Michael - (worobey) <[worobey@arizona.edu](mailto:worobey@arizona.edu)>; Aspinwall, Craig A - (aspinwal) <[aspinwal@arizona.edu](mailto:aspinwal@arizona.edu)>; Zinsmaier, Konrad E - (kez4) <[kez4@arizona.edu](mailto:kez4@arizona.edu)>; Castro, Christopher L - (clcastro) <[clcastro@arizona.edu](mailto:clcastro@arizona.edu)>; Peterson, Mary A - (mapeters) <[mapeters@arizona.edu](mailto:mapeters@arizona.edu)>  
**Cc:** Gomez, Rebecca L - (rgomez) <[rgomez@arizona.edu](mailto:rgomez@arizona.edu)>  
**Subject:** Approval for courses used in the proposed BA/BS in Science

Dear Doug, Lee, Joyce, Mike, Craig, Konrad, Chris, and Mary,

I am writing to obtain your approval to use the courses listed below from your departments in the proposed BS and BA in Science. The degrees will be offered in the online campus. Please respond to this email message and copy all. Please contact me directly on a different email thread with any questions.

Rebecca

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<image001.png> **Rebecca Gómez, PhD (She/Her/Ella)**

Associate Dean for Undergraduate Student Success  
 College of Science  
 Professor of Psychology and Cognitive Science  
 Gould-Simpson 1025  
 PO Box 210077 | Tucson, AZ 85721  
[rgomez@arizona.edu](mailto:rgomez@arizona.edu)

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[<image002.png>](#)

**Subject:** Re: Approval for courses used in the proposed BA/BS in Science  
**Date:** Thursday, January 19, 2023 at 9:03:29 PM Mountain Standard Time  
**From:** Peterson, Mary A - (mapeters)  
**To:** Aspinwall, Craig A - (aspinwal), Schroeder, Joyce A - (joyces), Gomez, Rebecca L - (rgomez), Doug Ulmer, Ryan, Lee - (ryant), Worobey, Michael - (worobey), Zinsmaier, Konrad E - (kez4), Castro, Christopher L - (clcastro)  
**CC:** Gomez, Rebecca L - (rgomez)  
**Attachments:** image003.png, image004.png, image005.png, image006.png

I approve.  
Best,  
Mary

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---

**From:** Aspinwall, Craig A - (aspinwal) <aspinwal@arizona.edu>  
**Sent:** Thursday, January 19, 2023 8:18:04 PM  
**To:** Schroeder, Joyce A - (joyces) <joyces@arizona.edu>; Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>; Doug Ulmer <ulmer@math.arizona.edu>; Ryan, Lee - (ryant) <ryant@arizona.edu>; Worobey, Michael - (worobey) <worobey@arizona.edu>; Zinsmaier, Konrad E - (kez4) <kez4@arizona.edu>; Castro, Christopher L - (clcastro) <clcastro@arizona.edu>; Peterson, Mary A - (mapeters) <mapeters@arizona.edu>  
**Cc:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>  
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approved



### Craig A Aspinwall, PhD

Department Head and Professor  
Chemistry & Biochemistry  
THE UNIVERSITY OF ARIZONA  
PO Box 210044 | Tucson, AZ 85721  
Office: 520-621-6338 | Cell: 520-245-3398  
[aspinwal@arizona.edu](mailto:aspinwal@arizona.edu)

Executive Assistant: Lisa Arrotta  
Office: 520-621-5672  
[lisaarrotta@arizona.edu](mailto:lisaarrotta@arizona.edu)

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**Sent:** Thursday, January 19, 2023 8:12 PM  
**To:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>; Doug Ulmer <ulmer@math.arizona.edu>; Ryan,

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Joyce

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**Subject:** Re: Approval for courses used in the proposed BA/BS in Science  
**Date:** Thursday, January 19, 2023 at 11:20:52 PM Mountain Standard Time  
**From:** Worobey, Michael - (worobey)  
**To:** Peterson, Mary A - (mapeters)  
**CC:** Aspinwall, Craig A - (aspinwal), Schroeder, Joyce A - (joyces), Gomez, Rebecca L - (rgomez), Doug Ulmer, Ryan, Lee - (ryant), Zinsmaier, Konrad E - (kez4), Castro, Christopher L - (clcastro)  
**Attachments:** image003.png, image004.png, image005.png, image006.png

Me too

Sent from my iPhone

On Jan 19, 2023, at 9:03 PM, Peterson, Mary A - (mapeters) <mapeters@arizona.edu> wrote:

I approve.  
Best,  
Mary

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**Subject:** Re: Approval for courses used in the proposed BA/BS in Science  
**Date:** Friday, January 20, 2023 at 11:21:06 AM Mountain Standard Time  
**From:** Mazumdar, Sumitendra - (mazumdar)  
**To:** Gomez, Rebecca L - (rgomez)  
**Attachments:** image002.png, image001.png

Dear Rebecca:

I approve of the use of introductory physics courses in the proposed BA and BS in Science.

Sumit Mazumdar  
Professor and Head  
Department of Physics

---

**From:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>  
**Sent:** Friday, January 20, 2023 10:35 AM  
**To:** Mazumdar, Sumitendra - (mazumdar) <mazumdar@arizona.edu>  
**Cc:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>  
**Subject:** FW: Approval for courses used in the proposed BA/BS in Science

Dear Sumit, I apologize that I did not include you in the original request below. Can you approve use of introductory physics courses in the proposed BA and BS in Science?

Thank you,



**Rebecca Gómez, PhD (She/Her/Ella)**

Associate Dean for Undergraduate Student Success  
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Dear Doug, Lee, Joyce, Mike, Craig, Konrad, Chris, and Mary,

I am writing to obtain your approval to use the courses listed below from your departments in the proposed

BS and BA in Science. The degrees will be offered in the online campus. Please respond to this email message and copy all. Please contact me directly on a different email thread with any questions.

Rebecca

- Math 122A (3) Functions of Calculus & Math 122B (3) First semester Calculus
- Math 125 (3) Calculus
- Math 113 (3) Elements of Calculus

**Statistics Requirement. (3 units) Complete 1 of the following:**

- Math 163 or 263 (3) Basic Statistics or Intro to Statistics and Biostatistics
- PSY 230 (3) Psychological Measurement and Statistics

**Core Science Requirement. (16 units) Complete 4 of the following (complete at least one course from each of biology, chemistry, and physics):**

- MCB 181 R/L (4) Introductory Biology I with lab
- ECOL 182 R/L (4) Introductory Biology 2 with lab
- CHEM 141 & 145 (4) General Chemistry 1: Quantitative Approach with lab
- CHEM 142 & 146 (4) General Chemistry 2: Quantitative Approach with lab
- PHYS 102 & 181 (4) Introductory Physics 1 with lab
- PHYS 103 & 182 (4) Introductory Physics 2 with lab
- Or
- PHYS 141 (4) Introductory Mechanics
- PHYS 241 (4) Introductory Electricity and Magnetism
- PHYS 242 (4) Introductory Relativity and Quantum Mechanics

**Additional Science Requirement (7 units). Complete 2 of the following:**

- NSCS 200 (3) Fundamentals of Neuroscience & Cognitive Science
- PSY 101 (4) Introduction to Psychology

**Capstone Requirement (1 unit)**

- SCI 401 (1) Science Capstone

**Upper division electives (24 units)**

**Students take at least 4 courses in one area and the remaining 4 courses from any of those listed below for a total of 8 upper division electives. Example areas are listed below. An area may also be a grouping of classes from a single STEM department.**

**Psychology**

- PSY 300 (3) Cognitive Neuroscience: A Guide to Mind and Brain
- PSY 340 (3) Introduction to Cognitive Development
- PSY 352 (3) Personality
- PSY 360 (3) Social Psychology
- PSY 381 (3) Abnormal Psychology
- PSY 383 (3) Health Psychology
- PSY 324 (3) Fundamentals of Aging
- PSY 412 (3) Animal Learning
- PSY 480 (3) Forensic Psychology

**Earth Systems and Sustainability**

- ATMO 336 (3) Weather, Climate, and Society
- HWRS 349A (3) Principals of Hydrology
- HWRS 349B (3) Principals of Hydrology Lab
- ATMO 436A (3) Weather Fundamentals

~CHEM 241A (3) Organic Chemistry Lecture 1

### **Genetics, Cell, and Molecular Biology**

- ECOL 320 (4) Genetics
- ECOL 326 (3) Genomics
- MCB 404 (3) Bioethics
- MCB 410 (3) Cell Biology
- MCB 411 (3) Molecular Biology
- MCB 422 (3) Problem Solving with Genetic Tools

### **Ecology, Evolution, and Animal Behavior**

- ECOL 406R (3) Conservation Biology
- ECOL 437 (4) Vertebrate Physiology
- ECOL 485 (4) Mammalogy
- ECOL 487R (3) Animal Behavior
- ECOL 487L (1) Animal Behavior Lab
- ECOL 488 (4) Arizona Mammals

### **Biochemistry**

- ~CHEM 241A (3) Organic Chemistry Lecture 1
  - CHEM 241B (3) Organic Chemistry Lecture 2
  - BIOC 384 (3) Foundations in Biochemistry
  - BIOC 385 (3) Metabolic Biochemistry
- (~required for the remaining 3 courses in this grouping)

### **Neuroscience**

- \*NROS 307 (3) Cellular Neurophysiology
  - \*NROS 310 (3) Molecular and Cellular Biology of Neurons
  - \*NROS 418 (3) Fundamental Principles of systems Neuroscience
  - NROS 308 (3) Methods in Neuroscience
  - NROS 330 (3) Principles of Neuroanatomy: Cells to Systems
  - NROS 430 (3) Neurogenetics
  - NROS 440 (3) How to build a Brain: Mechanisms of Neural Development
- (\*recommended courses)

### **Cognitive Science**

- NSCS 320 (3) Issues and Themes in Cognitive Science
- CGSC 344 (3) Modeling the Mind: Computational Models of Cognition
- CGSC 310 (3) Multisensory Perception
- PSY 300 (3) Cognitive Neuroscience: A Guide to Mind and Brain (note: students may count this course toward one grouping only)



### **Rebecca Gómez, PhD (She/Her/Ella)**

Associate Dean for Undergraduate Student Success  
College of Science  
Professor of Psychology and Cognitive Science  
Gould-Simpson 1025  
PO Box 210077 | Tucson, AZ 85721  
[rgomez@arizona.edu](mailto:rgomez@arizona.edu)

LAND ACKNOWLEDGEMENT: We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.



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***The University of Arizona Purpose & Values:***

Working together to expand human potential,  
explore new horizons and enrich life for all.

Integrity • Compassion • Exploration  
Adaptation • Inclusion • Determination

TO: UGC, U-CAAC

FROM: Rebecca Gómez, Associate Dean for Undergraduate Student Success, College of Science

CC: Carmala Garziona, Dean, College of Science

DATE: February 14, 2023

SUBJECT: U-CAAC requested changes to proposed BA and BS in Science

Students in the BA take 3 of 5 upper division courses in one area. Students in the BS take 4 of 7 upper division courses in one area. Different areas may have different prerequisites offered at the 100 and 200 level.

The U-CAAC subcommittee that reviewed the proposed BA and BS in Science raised a concern that students would have difficulty navigating the different concentration areas in the degrees.

The College of Science will address this concern by developing advising plans for each area to help guide students to the necessary prerequisites for their chosen area of focus and the additional courses they may or may not take outside their focus.



**From:** [Gomez, Rebecca L - \(rgomez\)](#)  
**To:** [Madden, Melanie Christine - \(melaniecmadden\)](#)  
**Cc:** [Gomez, Rebecca L - \(rgomez\)](#)  
**Subject:** FW: Meeting to put assessment plans for a new degree program in Taskstream  
**Date:** Thursday, March 23, 2023 4:04:15 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)  
[image005.png](#)  
[image006.png](#)  
[image007.png](#)  
[Assessment Plan BA.docx](#)

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Dear Melanie,

Please see the email confirmation I received from Elaine. I would be happy to write a memo for her to sign that would provide more detailed information if the message below is insufficient either because it has so little information or because she only mentions the BA. If there are specific issues I need to highlight for UGC I'm happy to include those. This attachment specifically lists the assessment plan for the BA but I mention below that the assessment plan for the BS is identical. Please advise.



**Rebecca Gómez, PhD (She/Her/Ella)**

Associate Dean for Undergraduate Student Success  
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Professor of Psychology and Cognitive Science  
Gould-Simpson 1025  
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**From:** Marchello, Elaine V - (evm) <evm@arizona.edu>  
**Date:** Monday, March 20, 2023 at 9:06 AM  
**To:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>  
**Subject:** RE: Meeting to put assessment plans for a new degree program in Taskstream

Hi Rebecca,  
Yes, I remember and after looking at the BA, I approve the assessment piece.

Elaine

Elaine Marchello, Ph.D.  
Assistant Director, Assessment  
University of Arizona  
University Center for Assessment, Teaching and Technology  
Integrated Learning Center Bldg 70

Room 105A  
Tucson, AZ 85721  
(520) 621-1328

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**From:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>  
**Sent:** Friday, March 17, 2023 4:33 PM  
**To:** Marchello, Elaine V - (evm) <evm@arizona.edu>  
**Cc:** Gomez, Rebecca L - (rgomez) <rgomez@arizona.edu>  
**Subject:** Re: Meeting to put assessment plans for a new degree program in Taskstream

Dear Elaine,

I understand that I will need an email from you confirming that we worked together to develop an assessment plan for the proposed BA and BS in Science and that you approve of our direct and indirect measures. I am attaching information from the proposal to remind you how we plan to approach this. We are using the same learning objectives and approach for the BA and BS in Science.

Many thanks and I hope you are doing well,



**Rebecca Gómez, PhD (She/Her/Ella)**

Associate Dean for Undergraduate Student Success  
College of Science  
Professor of Psychology and Cognitive Science  
Gould-Simpson 1025  
PO Box 210077 | Tucson, AZ 85721  
[rgomez@arizona.edu](mailto:rgomez@arizona.edu)

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**From:** Gomez, Rebecca L - (rgomez) <[rgomez@arizona.edu](mailto:rgomez@arizona.edu)>  
**Date:** Wednesday, January 18, 2023 at 10:08 AM  
**To:** Marchello, Elaine V - (evm) <[evm@arizona.edu](mailto:evm@arizona.edu)>  
**Subject:** Re: Meeting to put assessment plans for a new degree program in Taskstream

Dear Elaine,

Thank you so much for your help with this and for the extra time it took for you to add course titles. This looks perfect. Thank you also for the help you provided on the table I will need to include in the additional information form for curricular affairs. I'll be in touch after approval so I can start work on the rest of the assessment process.

**Rebecca Gómez, PhD (She/Her/Ella)**

Associate Dean for Undergraduate Student Success  
Professor of Psychology and Cognitive Science



Gould-Simpson 1025  
PO Box 210077 | Tucson, AZ 85721  
[rgomez@arizona.edu](mailto:rgomez@arizona.edu)

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**From:** Marchello, Elaine V - (evm) <[evm@arizona.edu](mailto:evm@arizona.edu)>  
**Date:** Wednesday, January 18, 2023 at 9:56 AM  
**To:** Gomez, Rebecca L - (rgomez) <[rgomez@arizona.edu](mailto:rgomez@arizona.edu)>  
**Subject:** RE: Meeting to put assessment plans for a new degree program in Taskstream

Rebecca,  
Here is the map. I added the course titles to make it more detailed. Let me know if you have questions or need any changes.

Elaine



**Elaine V Marchello, Ph.D.**

Assistant Director, Assessment  
Office of Instruct & Assess  
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**From:** Gomez, Rebecca L - (rgomez) <[rgomez@arizona.edu](mailto:rgomez@arizona.edu)>  
**Sent:** Monday, January 16, 2023 12:24 PM  
**To:** Marchello, Elaine V - (evm) <[evm@arizona.edu](mailto:evm@arizona.edu)>  
**Cc:** Sheldon, Laurie - (lsheldon) <[lsheldon@arizona.edu](mailto:lsheldon@arizona.edu)>  
**Subject:** Re: Meeting to put assessment plans for a new degree program in Taskstream