



Academic Review Committee Request Form: Program Revision

ARC Use Only:

ARC #: _____

Program ID: _____

Status: _____

(A=Approved, I=Info item only, R=Returned)

Date rec'd by ARC: _____

All ARC program proposals must be submitted electronically. Please work with your unit ARC representative to be sure your proposal is complete. After your proposal has received the required approvals, e-mail this completed form along with all supporting materials to ARC@ramapo.edu. Please use digital signatures for approvals.

SECTION A: Program Information

Program Title¹: _____

School(s): _____ Convening Group(s): _____

Proposal Date: _____ Effective Date: ☐ Fall 2025 if possible

Please attach a description of the proposed changes and all supporting documentation.

Additional course options among required courses (all concentrations). Reactivate two mothballed concentrations (Physical Sciences, Biological & Environmental Sciences) and rename the latter as "Life Sciences"

SECTION B: Approvals

Reviewed and Approved by:

See next page - multiple convening groups / schools impacted

Title	Type Name	Signature	Date
Convener			
Graduate Council Chair			
Dean (secondary)			
Dean - primary (TAS)			

ARC Disposition:

- ☐ Information item only - no ARC approval necessary
- ☐ Faculty Assembly approval not needed; ARC approves
- ☐ Faculty Assembly approval not needed; ARC does not approve
- ☐ ARC recommends approval by the Faculty Assembly
- ☐ ARC does NOT recommend approval by the Faculty Assembly

ARC Chair: _____

Date: _____

ARC recommends the following:

Office of the Provost Use Only:

☐ Approved ☐ Not Approved Provost Signature _____ Date: _____

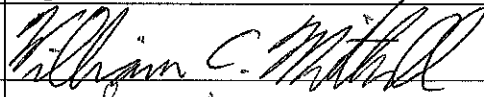
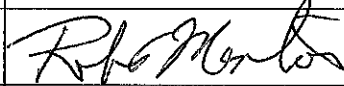
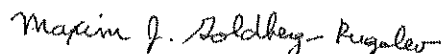
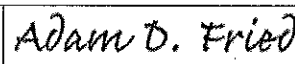
¹ If the request is to change the program title, enter the *current* title here

² Proposal must be received by ARC by November 1st 2022

Signature Page, INSS Curriculum Revisions

Title	Type Name	Signature	Date
Convener, INSS	Emma Rainforth		3/2/25
Dean, TAS	Eddie Saiff	see previous page	

Impacted Convening Groups

Title	Type Name	Signature	Date
Convener, BIOL	Bill Mitchell		3/3/25
Convener, ENSC/GEOL	Emma Rainforth		3/2/25
Convener, CHEM	Rob Mentore		3/3/25
Convener, PHYS	Catalin Martin		3/06/2025
Convener, MATH	Max Goldberg-Rugalev		3/2/25
Assistant Dean, TE	Adam Fried		3/2/25
Dean, SSHS	Aaron Lorenz	see previous page	

Integrated Science Studies

Program Changes - part 1: Reinstating former concentrations & Core Course updates

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The Existing INSS Major

Currently the INSS curriculum is structured as follows:

- All 100-level science disciplines (lec/labs): 44 credits
 - Calculus
 - SCIN 295 Development of Scientific Thought (WI, gen ed history)
 - Concentration: 20 credits
 - Science and Society
 - Public Policy
 - Business Studies
 - Science journalism
 - Capstone SCIN 435 Science Communication (fka Writing about science for public media)
 - An “experiential” component outside the lab courses (e.g., internships, research, journal club)
- Total 76 credits (of which 14 double-count in gen ed - math, sci, history)

The only courses offered by the major are SCIN 295 and 435. The rest of the major is serviced by other programs. Currently this is not a drain on resources for those programs, because enrollments are very low (and conversely, SCIN 295 and 435 are usually run as independent studies due to insufficient enrollments).

Effective 2014, two science concentrations were mothballed, because (1) no students took them and (2) the selection of courses in these concentrations had numerous hidden prereqs, making it impractical for students to take them.

- Biological and Environmental Sciences
- Physical Sciences

Current students

Total enrollment: 4

- All 4 have switched out of other science majors (e.g., CHEM, ENSC) due to science-GPA issues, but they still want a science degree.
 - This has been the case for all but a couple of students in the last decade.
- Other science/nursing drop-outs end up outside of TAS (e.g., to Psychology, and SocSci contract major)
 - This is probably due mostly to the invisibility of the program.
 - Though in some cases, their major-GPA may not be salvageable for INSS.

Rationale/Considerations for Program Revision

TI:dr: (1) reinstate the two Science concentrations for (a) students who change major (keeps them in TAS / helps course enrollment in PHYS/CHEM upper level courses) and (b) attract new students - DCP (as demographics change) as well as creating high school science teachers (currently impractical); (2) provide additional options for some of the foundational math/chem/phys courses.

INSS is currently not the first choice of program for students enrolled in it; generally, students have changed majors (often quite late) from other TAS lab science programs (and the majority of those wind up in the social science contract major instead). It is very small (low enrollments), in part probably because the name is somewhat opaque. It would be nice to increase enrollments to where the two courses offered by the major can actually run; especially as, being the only two courses operated by the program, this is where program assessment takes place. Given that most of the students have switched from other TAS majors, if the INSS major grows to even 20 students, there will be only a small increase in 100-level lec/lab course enrollments in those TAS majors (BIOL, CHEM, PHYS, ENSC) that the students hadn't yet completed the 100-level courses in.

Conversely, even modest enrollment increases (to ~20 students) will make the difference for some CHEM and PHYS upper level courses to become viable, given current low numbers of majors in those two programs.

In addition to making INSS a more desirable destination for students switching out of other TAS majors, there are two demographics that we would like to provide for - both of whom are basically not served at Ramapo currently:

- Prospective high school science teachers: currently, to be a HS science teacher, in practice one must complete the disciplinary major (BIOL, CHEM, PHYS) plus the EDUC requirements; and this can not be done in 128 credits. Prospective HS science teachers therefore are unlikely to be coming to Ramapo. However, the changes proposed here would provide 128-credit options for prospective science teachers (with the possibility of an additional content-area endorsement by adding just a couple of courses).
- Returning, non-traditional, and DCP students: currently, students with large numbers of transferred credits may find it impractical to complete a BIOL/CHEM/PHYS/ENSC major, because they do not have the *right* combination of courses. With the recent increase in transferable credits, and anticipated growth in DCP-type students, the INSS program could be the only viable way these students can get a science degree. Currently, these students would graduate with a science degree and far more than 128 credits; or they wind up in the Social Science contract major. The INSS program / Ramapo *has* lost students simply because they can not complete a science degree expeditiously.

The changes proposed here are of two types:

- (1) Additional options for the 100-level foundational courses in some disciplines (PHYS, CHEM, MATH)
- (2) Additional concentrations in the sciences.

We believe that these changes have the potential to attract students that would otherwise not consider Ramapo (due to the impracticality of doing a conventional BS in CHEM/PHYS/BIOL/ENSC), in addition to providing greater flexibility for existing Ramapo students.

Both the 100-level course options and concentrations were developed in consultation with the respective convening groups, who provided specific courses for the INSS major that would be beneficial to both INSS and the programs offering those courses.

The tracks (degree audits) and 4-year plans for the prospective high school science teachers were developed in conjunction with Teacher Education.

Proposed Changes

I. Core Requirements:

- Remove PHYS 103
- Additional math options - varies by concentration
 - Physical Sciences: MATH 121
 - All other concentrations: one of MATH 106, 108, 110, 121
- Allow PHYS 116+117 in place of 111+113.
- Allow CHEM 111/111L in place of Gen Chem 1&2, but NOT for the Physical Sciences concentration.

Rationale:

- Removal PHYS 103: reduce the size of the major. This is a gen ed course, does not have a lab, and taught solely by adjuncts. Removing it from the major is no great loss.
- Math options:
 - The existing social science concentrations do not have courses that have Calculus 1 as a prereq. - Calc 1 is overkill.
 - Most students need to take Precalc (MATH 110) as a prereq for Calculus, increasing the credit requirements.
 - There are alternative math courses (106, math modeling; 108, elementary prob & stats) that are more useful for the existing concentrations.
 - Math 121 will be required only for the Physical Sciences concentration, because upper level CHEM and PHYS courses generally require Calculus 1.
- PHYS 116/117 substitution: students transferring from the PHYS major (or bringing credits from elsewhere) will have taken PHYS 116+117, Physics with Calculus, which is a more advanced sequence than 111+113. This is a substitution that is frequently made.
- CHEM 111 is the foundational chemistry lab course for students in allied health fields. Allowing this one-semester course in place of the two semester General Chemistry sequence (CHEM 116+117) will make it easier for students transferring from those majors, and provide another lab-chemistry option for students in most of the concentrations (reducing the burden on the chemistry program).

II. Reinstate the following two concentrations (which should not need either State or BoT approval, as they were never *formally* discontinued):

- "Physical Sciences"
- "Biological and Environmental Sciences" - but rename it, "Life Sciences"

Requirements of the Physical Sciences Concentration: take 20 credits from among the following:

GEOL 210, 333, 327

ENSC 305, 343/343L¹

CHEM 206/206L, 324/324L, CHEM 435, CHEM 445

¹ Would list this under it's CHEM designation - pending # from REG

PHYS 215, PHYS 242, PHYS 305, PHYS 320, PHYS 350

Requirements of the Life Sciences concentration: take 20 credits from among the following (at least one at 300/400 level):

Any BIOL courses at 200-400 level

Select NURS courses - see convener

Rationale:

- **Viable pathway for prospective high school science teachers.**
 - Currently, students major in PHYS, CHEM, BIOL and have to squeeze the EDUC courses in; this can not be done in 4 years/128 credits.
 - The restructuring of the INSS core, and addition of these two science concentrations, with EDUC courses, *can* be completed in 128 credits.
 - Future Biology teachers would take the Life Sciences concentration.
 - Future Physics, Chemistry, and Physical Science teachers would take the Physical Sciences concentration.
 - Four-year plans will be developed for each population, specifying which concentration courses the future educator should take for a particular content-area certification.
- Some INSS students want to have a more science-rich concentration.
- Some INSS students transfer from other TAS majors, with more just the foundational lec-lab sequence in that discipline. This would enable those courses to count in the INSS major.
- Provides more options for transfer and DCP students. Currently, science-interested DCP students must either declare a science major, and it may take them longer than 2 years to finish; more commonly, they take the Social Science DCP option. These two concentrations would be attractive to DCP students wanting a science degree.

Side-by-side view of changes (next page)

Existing	New (section headers, courses, concentrations)						
INSS Major Requirements							
	Foundations (NEW HEADER)						
BIOL 111							
BIOL 111L							
BIOL 113							
BIOL 113L							
CHEM 117	or CHEM 111 (not for Physical Sciences concentration)						
CHEM 117L	or CHEM 111L (not for Physical Sciences concentration)						
ENSC 103							
GEOL 106							
GEOL 106L							
MATH 121	or MATH 106 or 108 or 110 (not for Physical sciences concentration)						
PHYS 103	remove						
PHYS 111	or PHYS 116						
PHYS 118L							
PHYS 113	or PHYS 117						
PHYS 119L							
SCIN 295							
	Select one: Capstone Requirement						
SCIN 435	or SCIN 4xx (Sci Comm for Educators)						
Select one: Experiential/Seminar							
	or EDUC 495						
Upper level concentration: Select one							
(no changes to existing concentrations)							
	Life Sciences						
	Physical Sciences						
	LIFE SCIENCES CONCENTRATION						
	20 credits at 200 level or above, including 4 at 300-400 level.						
	Students seeking Biology content endorsement for high school teaching should select 20 credits from BIOL only, including 12 or more at 300-400 level.						
	Select from any BIOL courses						
	Select from NURS courses: convener approval required						
	PHYSICAL SCIENCES CONCENTRATION						
	Select 20 credits from the following, including 4 or more at 300-400 level (12 or more at 300-400 level if seeking TE content endorsement)						
	Students seeking Physical Sciences content endorsement for high school teaching should select 20 credits, including 12 or more at 300-400 level.						
	Students seeking Physics content endorsement for high school teaching should select 20 credits from PHYS only, including 12 or more at 300-400 level.						
	Students seeking Chemistry content endorsement for high school teaching should select 20 credits from PHYS only, including 12 or more at 300-400 level.						
	GEOL 210						
	GEOL 327						
	GEOL 333						
	ENSC 305						
	CHEM 206 and						
	CHEM 206L						
	ENSC 343 and (note: waiting for CHEM course number for this course)						
	ENSC 343L (note: waiting for CHEM course number for this course)						
	CHEM 324 and						
	CHEM 324L						
	CHEM 435						
	CHEM 445						
	PHYS 215						
	PHYS 242						
	PHYS 305						
	PHYS 320						
	PHYS 350						

Requirements

(63-72 credits)

- I. Science Foundations** (39- 44 cr)
- | | |
|--|---------|
| BIOL 111/111L and 113/113L | 10 |
| CHEM 116/116L and 117/117L (<i>any concentration</i>) | 10 or 5 |
| or CHEM 111/111L (<i>not for students in Life Sciences, Physical Sciences</i>) | |
| PHYS 111 and 113 | 8 |
| or PHYS 116 and 117 (<i>recommended for physical science concentration</i>) | |
| PHYS 118L and 119L | 2 |
| GEOL 106/106L | 6 |
| ENSC 103 | 4 |
| SCIN 295 | 4 |
- II. Math Foundation* (4 cr)
- MATH 121 (*required for Physical Science concentration*)
or MATH 106 or 108 or 110
- III. Capstone* (1 or 4 cr)
- SCIN 4xx Science Communication² or
SCIN 4xx Science Communication for Educators (*TE students only; coreq EDUC 495*)
- IV. Experiential – pick one* (0–4 cr)
- | | |
|--|---------------------|
| SCIN 205 Field Experiences | 0.5-2 |
| SRSB 301 and SRSB 302 | 2 |
| BIOL 415 Current Advancements Biol Science | 1.5 |
| Teaching Assistant (BIOL/CHEM/ENSC/GEOL 411) | 2 |
| Approved internship/co-op/study abroad | 0-4 |
| EDUC 495 (clinical practice) (<i>TE students only</i>) | 0 (12) ³ |
- V. Area of specialization:* (20 cr)
- Select one of these concentrations:
- Science and Society
 - Science journalism
 - Public policy

² Formerly SCIN 435 Writing about science for public media

³ For degree audit / credit-counting purposes, these 12 credits are in the TE program and the fulfillment of that course meets the INSS experiential requirement. It is counted credit-wise for INSS, as zero credits (i.e., completion of requirement, rather than of the specific 12 credits). Analogous to Pathways, and ?HGS International requirement.

Business studies

[Life sciences](#) (new-ish)

[Physical sciences](#) (new-ish)

****Substitutions to Foundations sequence:***

DCP students only: DCP Students may substitute *one* of the subject areas (BIOL, CHEM, PHYS, or GEOL+ENSC), with 8 (or more) credits beyond the foundational sequence in one of the other 3 subject areas. These substitutions will not *also* fulfill concentration requirements. Substitutions must be approved by convener.

TE Students only: Students enrolled in the TE program may substitute a non-lab science course in one of the content areas they are not intending to teach in; that substitution is “balanced” by the EDUC 310 requirement in the TE program. Substitutions must be approved by convener.

- For students seeking Biology certification: PHYS 101 *or* (PHYS 111+113+118L+119L) *or* (PHYS 116+117+118L+119L)
- For students seeking Chemistry, Physics, or Physical Science certification: BIOL 101 *or* (BIOL 111+111L+113+113L)

Note to ARC / Registrar: Rationale for handling these two populations with manually-entered substitutions by convener, rather than building the substitutions into UAchieve: we would need to create multiple degree audits - a generic audit to go with each of the 6 concentrations; 5 TE audits (one for each content area endorsement and tied to TE enrollment), and a DCP audit with each of the 6 concentrations. If that CAN be done - fantastic. If not - convener will enter the substitutions. (Convener has the access to do this.)

Generic Four Year Plan - For all students except those seeking TE certification

	Fall		Spring	
Year 1	GE: INTD 101 First Year Seminar	4	GE/Major: ENSC 103 Intro Enviro Science	4
	Major: Foundations I lec/lab course ⁴	5-6	Major: Foundations II lec/lab course	5-6
	GE: CRWT 102 Critical Reading & Writing II	4	GE: Requirement ⁵	4
			GE/major: Math ⁶	4
	<i>Total</i>	<i>13-14</i>		<i>17-18</i>
Year 2	Major: Foundations I lec/lab course	5	Major: Foundations II lec/lab course	5
	Major: GEOL 106+106L Funds. Earth Sci lec/lab - WI	6	GE/Major: SCIN 295 Dev. Sci. Thought - WI	4
	GE: Requirement	4	GE: Requirement	4
			Free elective	4
	<i>Total</i>	<i>15</i>		<i>17</i>
Year 3	Major: Foundations I lec/lab course	5-6	Major: Foundations II lec/lab course	5-6
	Major: Concentration course ⁷	4	Major: Concentration course	4
	GE: Requirement	4	GE: Requirement	4
	Free elective	4	Free elective	4
	<i>Total</i>	<i>17-18</i>		<i>17-18</i>
Year 4	Major: Concentration course	4	Major: SCIN 435 Capstone - WI	4
	Major: Concentration course	4	Major: Experiential/seminar requirement	0-4
	Free elective	4	Major: Concentration course	4
	Free elective	4	Free elective	4
	<i>Total</i>	<i>16</i>		<i>16</i>

⁴ Three Foundations I-II lec/lab sequences required (BIOL, CHEM, PHYS). Life Sciences concentration should take BIOL sequence in year 1, and CHEM & PHYS in years 2 & 3 (interchangeable). Physical Sciences concentration should take CHEM sequence in year 1, PHYS in year 2, BIOL in year 3. Other concentrations: any order.

⁵ GE Requirements: the following 5 Gen Ed requirements can be taken in any order/semester. SOSC 110 Social Science Inquiry; AIID 201 Studies in Arts & Humanities; Global Awareness; Distribution Category 1; Distribution Category 2. The remaining GE requirements are specific courses that double-count in the major (Math, Scientific Reasoning, Historical Perspectives).

⁶ Physical Sciences concentration: MATH 121 required (Math 122 *recommended* if taking PHYS options). All others, MATH 121 or 106 or 108 or 110.

⁷ Five required, can be taken in any order

**Four Year Plan - For students seeking TE certification - Biology
(INSS - Life Sciences concentration)**

	Fall		Spring	
Year 1	GE: INTD 101 First Year Seminar	4	GE/Major: ENSC 103 Intro Enviro Science	4
	Major: BIOL 111/111L Funds. Biology I lec/lab - WI	5	Major: BIOL 113/113L Funds. Biology II	5
	GE: CRWT 102 Critical Reading & Writing II	4	GE: Requirement ⁸	4
	GE/major: Math ⁹	4	GE: Requirement	4
	<i>Total</i>	<i>17</i>		<i>17</i>
Year 2	Major: CHEM 116/116L Gen. Chem I lec/lab	5	Major: CHEM 117/117L Gen. Chem II lec/lab	5
	Major: GEOL 106+106L Funds. Earth Sci lec/lab - WI	6	GE/Major: SCIN 295 Dev. Sci. Thought - WI	4
	GE: Requirement	4	TE/GE: EDUC 211 Student Literacy Corps	4
			TE: EDUC 221 Social Context of Education	4
	<i>Total</i>	<i>15</i>		<i>17</i>
Year 3	Major: PHYS 101	4	Major: Life Sciences Concentration course	4
	Major: Life Sciences Concentration course ¹⁰	4	Major: Life Sciences Concentration course	4
	TE/GE: EDUC 241 Instructional Tech	4	TE: EDUC 301 Meeting the needs of all learners	2
	TE: EDUC 222 Teaching Princ & Practice	4	TE: EDUC 360 Intro to Special Education	4
			Free elective ¹¹	4
	<i>Total</i>	<i>16</i>		<i>18</i>
Year 4	Major: Life Sciences Concentration course	4	Major: SCIN 4xx Capstone - WI	1
	Major: Life Sciences Concentration course	4	TE/Major: EDUC 495 (fulfills experiential)	12
	TE: EDUC 310 Methods in Content areas - math/science	4		
	TE: EDUC 350 Reading & Writing in the content areas	4		
	<i>Total</i>	<i>16</i>		<i>13</i>

⁸ GE Requirements: the following 3 Gen Ed requirements can be taken in any order. SOSC 110 Social Science Inquiry; AIID 201 Studies in Arts & Humanities; Global Awareness. The remaining GE requirements are specific courses that double-count in the major (Math, Scientific Reasoning, Historical Perspectives) or Teacher Education (Dist. Values & Ethics, Systems & Society).

⁹ MATH 121 or 106 or 108 or 110.

¹⁰ Five required, can be taken in any order. At least 12 credits at the 300/400 level.

¹¹ PSYC 347 recommended (to add Middle School certification)

**Four Year Plan - For students seeking TE certification - Physics, Chemistry, Phys. Sci.
(INSS - Physical Sciences concentration)**

	Fall		Spring	
Year 1	GE: INTD 101 First Year Seminar	4	GE/Major: ENSC 103 Intro Enviro Science	4
	Major: CHEM 116/116L Gen. Chem I lec/lab	5	Major: CHEM 117/117L Gen. Chem II lec/lab	5
	GE: CRWT 102 Critical Reading & Writing II	4	GE: Requirement ¹²	4
	GE/major: MATH 121	4	GE: Requirement	4
	<i>Total</i>	<i>17</i>		<i>17</i>
Year 2	Major: PHYS 111 or 116	4	Major: PHYS 113 or 117	4
	Major: PHYS 118L	2	Major: PHYS 119L	2
	Major: GEOL 106+106L Funds. Earth Sci lec/lab - WI	6	GE/Major: SCIN 295 Dev. Sci. Thought - WI	4
	GE: Requirement	4	TE/GE: EDUC 211 Student Literacy Corps	4
			TE: EDUC 221 Social Context of Education	4
	<i>Total</i>	<i>16</i>		<i>18</i>
Year 3	Major: BIOL 101	4	Major: Physical Sciences Concentration course	4
	Major: Physical Sciences Concentration course ¹³	4	Major: Physical Sciences Concentration course	4
	TE/GE: EDUC 241 Instructional Tech	4	TE: EDUC 301 Meeting the needs of all learners	2
	TE: EDUC 222 Teaching Princ & Practice	4	TE: EDUC 360 Intro to Special Education	4
			Free elective ¹⁴	1-4
	<i>Total</i>	<i>16</i>		<i>15-18</i>
Year 4	Major: Physical Sciences Concentration course	4	Major: SCIN 4xx Capstone - WI	1
	Major: Physical Sciences Concentration course	4	TE/Major: EDUC 495 (fulfills experiential)	12
	TE: EDUC 310 Methods in Content areas - math/science	4		
	TE: EDUC 350 Reading & Writing in the content areas	4		
	<i>Total</i>	<i>16</i>		<i>13</i>

¹² GE Requirements: the following 3 Gen Ed requirements can be taken in any order - SOSC 110 Social Science Inquiry; AIID 201 Studies in Arts & Humanities; Global Awareness. The remaining GE requirements are specific courses that double-count in the major (Math, Scientific Reasoning, Historical Perspectives) or Teacher Education (Dist. Cat. Values & Ethics, Systems & Society).

¹³ Five required, can be taken in any order. At least 12 credits at the 300-400 level. Chemistry certification: must select from CHEM courses only. Physics certification: select from PHYS courses only; Math 122 *recommended*. Physical Science certification: select from any courses in the concentration.

¹⁴ PSYC 347 recommended (to add Middle School certification)