## **Program Change Request**

Date Submitted: 04/01/24 1:49 pm

Viewing: IN-MS-P002: INTO Mason: Science

# **Graduate Pathways**

Last approved: 07/13/22 3:55 pm

Last edit: 04/02/24 11:12 am Changes proposed by: cbrady12

**Catalog Pages Using this Program** 

**INTO Mason: Science Graduate Pathways** 

Are you completing this form on someone else's behalf?

Nο

**Effective Catalog:** 2024-2025

**Program Level:** Graduate

**Program Type:** INTO-Mason

Title:

**INTO Mason: Science Graduate Pathways** 

Registrar's Office Use Only -

**Program Start Term** 

Registrar/OAPI Use Only - SACSCOC

**Status** 

Concentration(s):

### In Workflow

- 1. IN Academic Director
- 2. IN Academic Affairs Dean
- 3. SC Curriculum Committee
- 4. SC Associate Dean
- 5. SC CAT Editor
- 6. Assoc Provost-Graduate
- 7. Registrar-Programs

### **Approval Path**

- 1. 10/27/22 12:19 pm Steven Scott (sscott4): Approved for IN Academic Director
- 2. 10/28/22 11:25 am Marcy Glover (mglover2): Approved for IN **Academic Affairs** Dean
- 3. 11/18/22 11:00 am **Gregory Craft** (gcraft): Approved for SC Curriculum Committee
- 4. 11/22/22 11:29 am Jennifer Bazaz Gettys (jbazaz): Approved for SC Associate Dean

- 5. 11/22/22 2:11 pm
  Jennifer Bazaz
  Gettys (jbazaz):
  Approved for SC CAT
  Editor
- 6. 04/03/23 6:24 pm
  Jason McKnight
  (jmckni): Rollback to
  Initiator
- 7. 04/04/23 12:15 pm Steven Scott (sscott4): Approved for IN Academic Director
- 8. 04/04/23 12:37 pm
  Marcy Glover
  (mglover2):
  Approved for IN
  Academic Affairs
  Dean
- 9. 04/28/23 11:02 am Gregory Craft (gcraft): Approved for SC Curriculum Committee
- 10. 05/02/23 3:05 pm Jennifer Bazaz Gettys (jbazaz): Approved for SC Associate Dean
- 11. 05/02/23 3:07 pm
  Jennifer Bazaz
  Gettys (jbazaz):
  Approved for SC CAT
  Editor
- 12. 09/14/23 2:12 pm Yellia Seanor (yseanor): Rollback to Initiator
- 13. 04/02/24 11:12 am Steven Scott

(sscott4): Approved for IN Academic Director

14. 04/02/24 11:37 am
Marcy Glover
(mglover2):
Approved for IN
Academic Affairs
Dean

### History

1. Jul 13, 2022 by Tory Sarro (vsarro)

	Associated Concentrations	Registrar's Office Use Only: Concentration Code
1	Accelerated INTO	ACC
2	Extended INTO	EXT
3	Standard INTO	STD
<u>4</u>	Bridge INTO (FRSC only)	

INTO Major(s):

	Associated Majors	Registrar's Office Use only: Major Code
1	Bioinformatics & Comp Biology	ВСВ
2	Bioinformatics Management	BNFM
3	Computational Science	COMP
<u>3</u> 4	Earth Systems Science	ESSC
<u>4</u> 5	Environmental Science & Policy	EVSP
<u>5</u> <del>6</del>	Forensic Science	FRSC
<u>6</u> <del>7</del>	Geographic & Cartographic Sci	GECA
<u>7</u> 8	Mathematics	MATH
<u>8</u>	Applied & Engineering Physics	PHAE

College/School: INTO Mason

4/15/24. 1:56 PM

Department /
Academic Unit:

**INTO Mason** 

Jointly Owned Program?

Yes

Participating Colleges

	College
1	College of Science

# Participating Departments

#### **Justification**

Replacing two INTO Mason special topics courses with permanent courses:

EAP 405 > EAP 401

INYO 508 > INYO 505

Replacing INTO Mason EAP 508 with EAP 507 in order to simplify curriculum.

Deactivating the Standard and Accelerated Pathways to the MS in Computational Science.

Adding approve Forensic Science Bridge pathway to "Associated Concentrations."

### and credit overload edits:

Now in their tenth year, INTO Mason Graduate Pathway programs get international and multilingual students started on a path to degree completion. Extra supports are built in to the pathway programs in the form of cultural transition coursework and English language coursework, under the course prefixes INYO (International Year One) and EAP (English for Academic Purposes). Therefore, those classes have been added as credit bearing which causes the over load. Content in these courses had been provided in non-credit-bearing workshops and courses in the past, but students did not see the importance of the skills without credits attached to them. Course content includes sessions with INTO Mason advising staff and explorations of students' academic disciplines as a way to help students professionalize and to transition into the American graduate school context. Combining those INYO and EAP supports with degree classes, ensures that Pathway students cannot opt out of key information, skills, and experiences that enable success in the Pathway and beyond to degree completion. The fact that INTO Mason students achieve higher graduation rates than their directly admitted classmates proves the effectiveness of these strategies. For this reason, the academic loads for Pathway students in the majority of programs exceed the maximum credit limits as put forth by the university for non-degree students, and in some cases, they exceed the maximum credit limits put forth for degree-seeking students. Simply put, getting these students ready for their graduate programs, starting as they do at a lower English proficiency level, requires this higher credit load as they are in their pathways for only one or two terms. The programs with the highest credit loads are for accelerated students who are only with INTO Mason for one semester and bridge students who are two-term students, yet they are coming to GMU with only a three-year degree so need the additional academic and cultural adjustment time, if not necessarily as much language support. Also of note is that Pathway students are coded as

'non-degree' even though they are full-time enrolled students on specific degree paths so we do feel they should be viewed, for purposes of this policy, as 'degree-seeking.' We have considered adding 'boot camp' style programming prior to the pathways, but this was prevented because of the complicated rules related to the students' I20 documents, and related to the unpredictable timing of student visa approvals.

### **Catalog Published Information**

Registrar's Office Use Only - Program Code:

IN-MS-P002

Registrar/IRR Use Only – Program CIP Code

INTO-Mason Requirements:

### **Applied and Engineering Physics Graduate Pathway**

The following grid is for the first semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> into the Master of Science in Applied and Engineering Physics degree:

#### Standard semester 1 of 2

Semester 1 of 2 1

PHYS 502 Introduction to Quantum Mechanics and Atomic Physics3

or PHYS 684 Quantum Mechanics I

EAP 506	Graduate Communication in the Disciplines I	4
<u>INYO 504</u>	Transitions for International Graduate Students	3
EAP 410	Language Support for International Students	2
Total Credits		12

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### A credit overload is required in this semester.

The following grid is for the second semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> <u>pathway</u> into the Master of Science in Applied and Engineering Physics degree:

Semester 2 of 2

<u>PHYS 513</u>	Applied Electromagnetic Theory	3
or PHYS 68	<u>5</u> Classical Electrodynamics I	
EAP 507	Advanced Graduate Communication Across the Disciplines	4
EAP 405	Special Topics in Advanced English for Academic Purposes	1
<del>INYO 508</del>	Special Topics Content Support in the Disciplines	1
<u>INYO 505</u>	Intercultural Competence and Professional Development for Multilingual Graduate Stu	dents1
EAP 401	Advanced English Grammar for Multilingual Students	<u>1</u>
Total Credit	ts	9

The following grid is for the single semester of the <u>Accelerated</u>, <u>single-semester Pathway</u> accelerated, <u>1-semester pathway</u> into the Master of Science in Applied and Engineering Physics degree:

Accelerated semester 1 of 1 1 **EAP 508 Graduate Communication in the Disciplines III** 4 EAP 405 Special Topics in Advanced English for Academic Purposes 1 PHYS 502 Introduction to Quantum Mechanics and Atomic Physics 3 or PHYS 684 Quantum Mechanics I PHYS 705 Classical Mechanics 3 **EAP 507** Advanced Graduate Communication Across the Disciplines4 INYO 504 Transitions for International Graduate Students EAP 401 Advanced English Grammar for Multilingual Students **Total Credits** 14

A credit overload is required in this semester.

# Bioinformatics and Computational Biology/Management Graduate Pathway

The following grid is for the first semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> into the Master of Science in Bioinformatics and Computational Biology / Management degree:

### Standard semester 1 of 2

### Semester 1 of 21

BINF 631 Molecular Cell Biology for Bioinformatics 3

or **BINF 630**Bioinformatics Methods

EAP 506 Graduate Communication in the Disciplines I 4

**INYO 504** Transitions for International Graduate Students3

EAP 410 Language Support for International Students 2

Total Credits 12

<u>1</u>

### A credit overload is required in this semester.

The following grid is for the second semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> <u>pathway</u> into the Master of Science in Bioinformatics and Computational Biology / Management degree:

Semester 2 of 2

BINF 631 Molecular Cell Biology for Bioinformatics

or **BINF 630**Bioinformatics Methods

EAP 507 Advanced Graduate Communication Across the Disciplines

EAP 405 Special Topics in Advanced English for Academic Purposes

INYO 508 Special Topics Content Support in the Disciplines

INYO 505 Intercultural Competence and Professional Development for Multilingual Graduate Students1

EAP 401 Advanced English Grammar for Multilingual Students

Total Credits

3

4

1 1

9

The following grid is for the single semester of the <u>Accelerated Pathway</u> accelerated, 1-semester

pathway into the Master of Science in Bioinformatics and Computational Biology / Management degree:

```
Accelerated semester 1 of 1
EAP 508 Graduate Communication in the Disciplines III
                                                                 4
EAP 405 Special Topics in Advanced English for Academic Purposes1
INYO 504Transitions for International Graduate Students
                                                                 3
CSI 690 Numerical Methods
                                                                 3
CSI 695 Scientific Databases
                                                                 3
Total Credits
                                                                 θ
Accelerated semester 1 of 11
EAP 508
           Graduate Communication in the Disciplines III
           Special Topics in Advanced English for Academic Purposes 1
EAP 405
BINF 631 Molecular Cell Biology for Bioinformatics
                                                                    3
or BINF 634Bioinformatics Programming
BINF 630 Bioinformatics Methods
                                                                    3
or BINF 633Molecular Biotechnology
           Advanced Graduate Communication Across the Disciplines4
EAP 507
INYO 504 Transitions for International Graduate Students
                                                                    3
EAP 401
           Advanced English Grammar for Multilingual Students
                                                                    <u>1</u>
Total Credits
                                                                    14
```

A credit overload is required in this semester.

Computational Science Graduate Pathway The following grid is for the first semester of the standard, 2-semester pathway into the Master of Science in ComputationalScience degree: The following grid is for the second semester of the standard, 2-semester pathway into the Master of Science in ComputationalScience degree: The following grid is for the single semester of the accelerated, 1-semester pathway into the Master of Science in ComputationalScience degree: Earth Systems Science Graduate Pathway

### Standard semester 2 of 2

EAP 507 Advanced Graduate Communication Across the Disciplines4
EAP 405 Special Topics in Advanced English for Academic Purposes 1
INYO 508Special Topics Content Support in the Disciplines
CSI 690 Numerical Methods
3
Total Credits

#### Standard semester 1 of 2

EAP 506 Graduate Communication in the Disciplines I

**EAP 410** Language Support for International Students

INYO 504Transitions for International Graduate Students3

CSI 695 Scientific Databases 3

**Total Credits** 

The following grid is for the first semester of the Standard, standard, 2-semester Pathway pathway into the Master of Science in Earth Systems Science degree:

0

### Standard semester 1 of 2

### Semester 1 of 2 1

**GGS 553** Geographic Information Systems 3

or GGS 560Quantitative Methods

or GGS 579Remote Sensing

EAP 506 Graduate Communication in the Disciplines I

**INYO 504** Transitions for International Graduate Students3

**EAP 410** Language Support for International Students

**Total Credits** 12

1

### A credit overload is required in this semester.

The following grid is for the second semester of the Standard, standard, 2-semester Pathway pathway into the Master of Science in Earth Systems Science degree:

### Standard semester 2 of 2

### Semester 2 of 2 1

3 GEOL 513 Hydrogeology

or GEOL 532 Paleoclimatology

**CLIM 512** Physical Oceanography

3

or GEOL 506Soil Science

EAP 507 Advanced Graduate Communication Across the Disciplines 4

EAP 405 Special Topics in Advanced English for Academic Purposes 1

1 **Special Topics Content Support in the Disciplines** INYO 508

**INYO 505** Intercultural Competence and Professional Development for Multilingual Graduate Students1

EAP 401 Advanced English Grammar for Multilingual Students

**Total Credits** 

### A credit overload is required in this semester.

The following grid is for the single semester of the Accelerated Pathway accelerated, 1-semester pathway into the Master of Science in Earth Systems Science degree:

Accelerated semester 1 of 11

EAP 508 Graduate Communication in the Disciplines III

EAP 405 Special Topics in Advanced English for Academic Purposes 1

GGS 553 **Geographic Information Systems** 3 12

### **Environmental Science and Policy Graduate Pathway**

The following grid is for the first semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> <u>pathway</u> into the Master of Science in Environmental Science and Policy degree:

### Standard semester 1 of 2

### Semester 1 of 2 1

EAP 506 Graduate Communication in the Disciplines I 4

EVPP 506Science of the Environment I

INYO 504 Transitions for International Graduate Students3

EAP 410 Language Support for International Students 2

Total Credits 12

1

### A credit overload is required in this semester.

The following grid is for the second semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> <u>pathway</u> into the Master of Science in Environmental Science and Policy degree:

### Semester 2 of 2

EVPP 507 Science of the Environment II

EAP 507 Advanced Graduate Communication Across the Disciplines 4

EAP 405 Special Topics in Advanced English for Academic Purposes 1

INYO 508 Special Topics Content Support in the Disciplines

INYO 505 Intercultural Competence and Professional Development for Multilingual Graduate Students1

EAP 401 Advanced English Grammar for Multilingual Students

Total Credits

9

The following grid is for the single semester of the <u>Accelerated Pathway</u> accelerated, 1-semester

pathway into the Master of Science in Environmental Science and Policy degree:

Accelerated semester 1 of 1 1

EAP 508 Graduate Communication in the Disciplines III

EAP 405 Special Topics in Advanced English for Academic Purposes 1

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EVPP or PUAD course	3		
EVPP or PUAD course	3		
EAP 507 Advanced Graduate Communication Across the Disciplines4			
INYO 504 Transitions for International Graduat	e Students 3		
EAP 401 Advanced English Grammar for Mult	<u>ilingual Students</u> <u>1</u>		
Total Credits	14		
<u>1</u>			
A credit overload is required in this semester.			

### **Forensic Science Graduate Pathway**

The following grid is for the first semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> into the Master of Science in Forensic Science degree:

### Standard semester 1 of 2

### Semester 1 of 2 1

FRSC 500 Introduction to Forensic Science 3

EAP 506 Graduate Communication in the Disciplines I 4

INYO 504 Transitions for International Graduate Students 3

EAP 410 Language Support for International Students 2

Total Credits 12

<u>1</u>

### A credit overload is required in this semester.

The following grid is for the second semester of the <u>Standard</u>, <u>standard</u>, 2-semester <u>Pathway</u> <u>pathway</u> into the Master of Science in Forensic Science degree:

#### Standard semester 2 of 2

### Semester 2 of 21

FRSC 510 Basic Crime Analysis	3
FRSC 570 Trace and Physical Evidence Concepts	3
EAP 507 Advanced Graduate Communication Across the Disciplines	4
EAP 405 Special Topics in Advanced English for Academic Purposes	1
INYO 508Special Topics Content Support in the Disciplines	1
INVO EQEIntercultural Competence and Professional Development for Multilingual Graduate Studen	n+c1

INYO 505Intercultural Competence and Professional Development for Multilingual Graduate Students

EAP 401 Advanced English Grammar for Multilingual Students

Total Credits 12

1

### A credit overload is required in this semester.

The following grid is for the single semester of the <u>Accelerated</u>, <u>accelerated</u>, 1-semester <u>Pathway</u> into the Master of Science in Forensic Science degree:

Accelerated semester 1 of 1 1

EAP 508 Graduate Communication in the Disciplines III

EAP 405 Special Topics in Advanced English for Academic Purposes 1

FRSC 500 Introduction to Forensic Science 3
FRSC 510 Basic Crime Analysis 3

EAP 507 Advanced Graduate Communication Across the Disciplines4
INYO 504 Transitions for International Graduate Students 3
EAP 401 Advanced English Grammar for Multilingual Students 1
Total Credits 14

<u>1</u>

### A credit overload is required in this semester.

the standard, 2-semester pathway into the Master of Science in Geographic and CartographicSciences degree: The following grid is for the second semester of the standard, 2-semester pathway into the Master of Science in Geographic and CartographicSciences degree: The following grid is for the single semester of the accelerated, 1-semester pathway into the Master of Science in Geographic and CartographicSciences degree: Mathematics Graduate Pathway The following grid is for the first semester of the standard, 2-semester pathway into the Master of Science in Mathematicsdegree: The following grid is for the first second semester of the Bridge Pathway standard, 2-semester pathway into the Master of Science in Forensic Science in Mathematics degree:

Geographic and Cartographic Sciences Graduate Pathway The following grid is for the first semester of

#### Standard semester 1 of 2

EAP 506 Graduate Communication in the Disciplines I **EAP 410** Language Support for International Students INYO 504Transitions for International Graduate Students3 CSI 695 Scientific Databases 3 **Total Credits** 0 Semester 1 of 2 1 <u>Upper-level Undergraduate Course</u> 3 FRSC 500Introduction to Forensic Science <u>3</u> EAP 506 Graduate Communication in the Disciplines I INYO 504Transitions for International Graduate Students3 Total Credits 13

<u>1</u>

### A credit overload is required in this semester.

<u>The following grid is for the second semester of the Bridge Pathway</u> <u>standard, 2-semester pathway</u> <u>into</u> <u>the Master of Science in Forensic Science degree: in Computational Science degree:</u>

### Semester 2 of 2 1

<u>Upper-level Undergraduate Course</u>	<u>3</u>
FRSC 510Basic Crime Analysis	<u>3</u>
FRSC 570Trace and Physical Evidence Concepts	<u>3</u>
EAP 507 Advanced Graduate Communication Across the Disciplines	<u>4</u>
INYO 505Intercultural Competence and Professional Development for Multilingual Graduate Stu-	dents1
EAP 401 Advanced English Grammar for Multilingual Students	<u>1</u>

Total Credits 15

<u>1</u>

A credit overload is required in this semester.

### **Geographic and Cartographic Sciences Graduate Pathway**

<u>The following grid is for the first semester of the Standard</u> <u>standard</u>, <u>2-semester Pathway</u> <u>into the Master of Science in Geographic and Cartographic Sciences degree:</u>

3

### Standard semester 1 of 2

### Semester 1 of 2 1

GGS 551 Cartographic Design

or GGS 553 Geographic Information Systems

or GGS 560 Quantitative Methods

or GGS 579Remote Sensing

EAP 506 Graduate Communication in the Disciplines I

**INYO 504** Transitions for International Graduate Students3

EAP 410 Language Support for International Students

Total Credits 12

<u>1</u>

A credit overload is required in this semester.

<u>The following grid is for the second semester of the Standard, 2-semester Pathway pathway into the Master of Science in Geographic and Cartographic Sciences degree:</u>

### Standard semester 2 of 2

### Semester 2 of 2 1

Required Major Courses (student will take two of the following):

GGS 551 Cartographic Design

or GGS 553 Geographic Information Systems

or GGS 560 Quantitative Methods

or GGS 579Remote Sensing

EAP 507 Advanced Graduate Communication Across the Disciplines 4

EAP 405 Special Topics in Advanced English for Academic Purposes 1

INYO 508 Special Topics Content Support in the Disciplines

INYO 505 Intercultural Competence and Professional Development for Multilingual Graduate Students1

EAP 401 Advanced English Grammar for Multilingual Students <u>1</u>

Total Credits 12

<u>1</u>

A credit overload is required in this semester.

<u>The following grid is for the single semester of the Accelerated Pathway</u> accelerated, 1-semester pathway into the Master of Science in Geographic and Cartographic Sciences degree:

Accelerated semester 1 of 1 1

EAP 508 Graduate Communication in the Disciplines III

4

6

1

EAP 405	Special Topics in Advanced English for Academic Purpose	<del>rs 1</del>
Required Maj	or Courses (student will take two of the following):	6
GGS 551	Cartographic Design	
or <u>GGS 55</u>	3Geographic Information Systems	
or <u>GGS 56</u>	OQuantitative Methods	
or <u>GGS 57</u>	9Remote Sensing	
EAP 507	Advanced Graduate Communication Across the Discipline	<u>es4</u>
<u>INYO 504</u>	Transitions for International Graduate Students	3
EAP 401	Advanced English Grammar for Multilingual Students	<u>1</u>
<b>Total Credits</b>		14
<u>1</u>		
A credit overload is required in this semester.		

### **Mathematics Graduate Pathway**

The following grid is for the first semester of the Standard, standard, 2-semester Pathway pathway into the Master of Science in Mathematics degree: Computational Science Graduate Pathway

### Standard semester 1 of 2

Semester 1 of 2 1 MATH 315 Advanced Calculus I 3 or MATH 675Linear Analysis Graduate Communication in the Disciplines I EAP 506 **INYO 504** Transitions for International Graduate Students3 EAP 410 Language Support for International Students **Total Credits** 12 <u>1</u>

A credit overload is required in this semester.

<u>The following grid is for the second first semester of the Standard, standard, 2-semester Pathway</u> pathway into the Master of Science in Mathematics degree: in Computational Science degree:

### Standard semester 2 of 2

Semester 2 of 2 1 MATH 321 Abstract Algebra 3 or MATH 621 Algebra I MATH 322 Advanced Linear Algebra 3 EAP 507 Advanced Graduate Communication Across the Disciplines 4 EAP 405 Special Topics in Advanced English for Academic Purposes 1 INYO 508 **Special Topics Content Support in the Disciplines** Intercultural Competence and Professional Development for Multilingual Graduate Students1 **INYO 505** EAP 401 Advanced English Grammar for Multilingual Students Total Credits 12

A credit overload is required in this semester.

### **Program Outcomes**

### **OAPI Use Only – Determination of SACSCOC Impact**

#### **Comments or Notes**

Does this program cover material which crosses into another department?

No

**Additional** 

**Attachments** 

Reviewer

**Comments** 

Jason McKnight (jmckni) (04/03/23 6:24 pm): Rollback: Rollback per request of Christina Brady Yellia Seanor (yseanor) (09/14/23 2:12 pm): Rollback: We are still waiting for final approval for language on AP.1.2 from Faculty Senate so continuing to hold new proposals until that is complete. Hopefully ready to move forward by October.

#### Additional

#### Comments

Justification added to explain the credit overloads required in the Pathways.

Notations added beneath each semester where overloads are required.

Formatting updated for consistency with other Pathway program entries.

Deactivating the Standard and Accelerated Pathways to the MS in Computational Science.

Looking into proposing Pathways to certificates instead.

Is this course required of all students in this degree program?

%wi\_required.eschtml%

Key: 986