Earth/Space Science

Teaching License

Ball State University July 2005

This handbook is designed to provide important information and guidance for students who are seeking a teaching license in **Earth/Space Science** in the senior high school, middle/junior high school, or both. The guide that follows should be used along with <u>regular visits</u> with your advisor as you progress through your program. Ultimately it is your responsibility to meet all requirements, but this handbook and your advisor can help you meet your obligations.

Advisor:

When you have questions about your program, contact your advisor.

Get in the habit of meeting with your advisor at least once a semester.

Advising questions may be brought to the Department of Geology office, AR117 (285-8270).

Content Contact:

If you have questions about coursework in any of these aspects of Earth/Space Science, contact these content specialists:

Content Area	Contact Person	Email	Phone	Office
Sedimentary Petrology	Grigsby, Jeffry D.	jgrigsby@bsu.edu	5-8264	AR 100
Stratigraphy	Fluegeman, Richard	rfluegem@bsu.edu	5-8267	AR 104
Low-Temperature Geochemistry	Neumann, Klaus	kneumann@bsu.edu	5-8262	AR 144
Petrology/Tectonics	Nicholson, Kirsten	knichols@bsu.edu	5-8268	AR 109
Geomorphology	Rice-Snow, Scott	ricesnow@bsu.edu	5-8269	AR 134
Hydrogeology	Samuelson, Alan	asamuels@bsu.edu	5-8270	AR 117
Astronomy	Kaitchuck, Ronald	rkaitchuc@bsu.edu	5-8871	CP 101
Climate/Weather	Arnold, David	darnold@bsu.edu	5-1768	CL 463E
Soils	Pichtel, John	jpichtel@bsu.edu	5-2182	WQ 103

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Levels of Licensure:

You may choose to be licensed to teach Earth/Space Science at:

- ? only the senior high school level, grades 9-12,
- ? only the middle/junior high school level, grades 5-8, or
- ? both middle/junior high and senior high school levels, grades 5-12.

While there are many similarities in these three options, there also are differences; so be sure to follow the plan that will entitle you to teach at your desired level or levels. If you choose to be licensed to teach Earth/Space Science at the high school level <u>and</u> general science (with an Earth/Space Science concentration) at the middle/junior high school level, please be aware that additional hours will be required.

Freshman Year:

- 1. Let your freshman advisor know you want to pursue a professional education program in Earth/Space Science.
- 2. SCI 150, Introduction to Science Teaching, is the required first course in all science teaching programs. Be aware that SCI 150 is only offered in the fall semester.

You must enroll in SCI 150 the first fall semester you are enrolled in a professional education program in science at Ball State University.

3. If you plan to teach at the middle/junior high school level only, or at both the senior high and middle/junior high school levels, take these courses in these semesters of your freshman year:

Spring Semester

Trail	Semester		
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SCI 150 GEOL 102 Earth, Life, and Time CHEM 111 General Chemistry 1 CHEM 112 General Chemistry 2

4. If you plan to teach only at the high school level, take these courses in these semesters of your freshman year:

Fall Semester Spring Semester

SCI 150 GEOL 102 Earth, Life, and Time CHEM 111 General Chemistry 1

5. The rest of your freshman year schedule will be made up of University Core Curriculum courses.

Earth/Space Science Course Requirements:

Option I: Teaching Major in Earth/Space Science Middle/Junior High School Option

The following courses (fifty-nine (59) hours of credit) are required for science licensure to teach at the middle/junior high school level.

GEOL	102	3	Earth, Life, and Time	ASTRO	120	3	Star Systems
	207	3	Environmental Geology		121	1	Astronomy Lab
	220	3	Earth Materials	CHEM	111	4	General Chemistry 1
	240	3	Geomorphology		112	4	General Chemistry 2
	290	1	Computer Geoscience	PHYCS	110	4	General Physics 1
	308	3	Invertebrate Paleontology		112	4	General Physics 2
	420	3	G P Oceans	BIO	111	4	Principles of Biology 1
GEOG	230	3	Elementary Meteorology		112	4	Principles of Biology 2
	265	3	Introduction to GIS	MATHS	112	3	Trigonometry
NREM	221	3	Soil Resources				
				TO	TAI.	59	

TOTAL

If you want to add a senior high school license to the middle/junior high school license, take these additional nine (9) hours.

GEOL 460 3 Hydrogeology **ASTRO** 122 3 Cosmo and Life (Take in place of ASTRO 121)

Choose 1 of three (3) courses:

GEOL	480	3	Spc Std Prob
GEOG	494	3	Research Methods
	495	3	Read Spc Std
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Option II: Teaching Major in Earth/Space Science Senior High School Option

The following courses (fifty-nine (59) hours of credit) are required for science licensure to teach at the senior high school level.

GEOL	102	3	Earth, Life, and Time	NREM	221	3	Soil Resources
	207	3	Environmental Geology	ASTRO	120	3	Star Systems
	220	3	Earth Materials		122	3	Cosmo and Life
	240	3	Geomorphology	CHEM	111	4	General Chemistry 1
	290	1	Computer Geoscience	PHYCS	110	4	General Physics 1
	308	3	Invertebrate Paleontology		112	4	General Physics 2
	420	3	G P Oceans	BIO	112	4	Principles of Biology 2
	460	3	Hydrogeology	MATHS	112	3	Trigonometry
GEOG	230	3	Elementary Meteorology				
	265	3	Introduction to GIS				

Research Experience (Choose one (1) of these three (3) courses)

GEOL	480	3	Spc Std Prob	
GEOG	494	3	Research Methods	
	495	3	Read Spc Std	
				TOTAL

If you want to add a middle/junior high school license to the senior high school license, take these additional eight (8) hours.

59

BIO Principles of Biology 1 111 General Chemistry 1 **CHEM** 112 4 **TOTAL**

When to Take Courses:

The Earth/Space Science Education Program is designed to provide a full and complete educational experience. It is important that you take courses in sequence when the courses are available. Please do not procrastinate.

On the next four pages you will find a suggested four-year plan of when to take courses. If you are seeking a:

- ? Middle/Junior High School Licensure only, go to **Schedule A**.
- ? Senior High School Licensure only, go to **Schedule B**.
- ? Combined Middle/Junior High School and Senior High School Licensure, go to Schedule C.

Schedule A
Four-Year Plan for Middle/Junior High School Earth/Space Science Education Program

	Fall			Code	Spring			Code
Freshman	UCC		9		UCC		9	
	SCI 150	Basic Concpt	3	F	GEOL 102	Earth Time	3	В
	CHEM 111	Gen. Chem. 1	4	В	CHEM 112	Gen. Chem. 2	4	В
	Total		16		Total		16	
Sophomore	GEOL 220	Earth Materials	3	F	GEOL 207	Environ. Geol.	3	S
Sophomore	MATH 112	Trigonometry	3	В	GEOL 240	Geomorph	3	S
	BIO 111	Princ. Bio. 1	4	В	BIO 112	Princ. Bio. 2	4	В
	GEOL 290	GeoComputers	1	F	UCC	1 mc. bio. 2	8	D
	EDMUL 205	Multi Educ	3	В	occ		O	
	EDPSY 251	Hu Grow Dev	3	В				
	Total		17		Total		18	
Junior	PHYS 110	Gen. Physics 1	4	В	PHYS 112	Gen. Physics 2	4	В
• • • • • • • • • • • • • • • • • • • •	ASTRO 120	Star Systems	3	F	GEOG 265	Intro. GIS	3	В
	ASTRO 121	Honors Lab	1	F	GEOG 230	Elem Meteor	3	В
	EDFON 420	Fnds of Educ	3	В	EDPSY 290	Educ Psychol	3	В
	UCC		6		SCI 395	Int Tch Sci	3	S
	Total		17		Total		16	
Senior	NREM 221	Soil Resources	3	В	EDSEC 460	St Tch Secon	6	В
Semoi	GEOL 308	Invert. Paleo	3	F	EDJHM 460	St Tch Jr M	6	В
	GEOL 420	G P Oceans	3	F	LDJIIVI 400	St Tell JI WI	U	В
	EDSEC 380	Prin Sec Sch	3	В				
	EDJHM 385	Prin Mid Sch	3	В				
	SCI 396	Sci Mth Mtrl	3	F				
	Total		18		Total		12	

Total Program: 130 hours

Course Codes

- B: Course offered Fall and Spring semesters, every year
- F: Course offered only Fall semester, every year
- S: Course offered only Spring semester, every year

Schedule B Four-Year Plan for Senior High School Earth/Space Science Education Program

	Fall			Code	Spring			Code
Freshman	UCC SCI 150 CHEM 111	Basic Concpt Gen. Chem. 1	9 3 4	F B	UCC GEOL 102	Earth Time	14	В
	Total		16		Total		17	
Sophomore	GEOL 220 MATH 112 BIO 112 GEOL 290 EDMUL 205 EDPSY 251	Earth Materials Trigonometry Princ. Bio. 2 GeoComputers Multi Educ Hu Grow Dev	3 3 4 1 3 3	F B B F B	GEOL 207 GEOL 240 GEOG 230 UCC	Environ. Geol. Geomorph Elem Meteor	3 3 3 9	S S B
	Total		17		Total		18	
Junior	GEOL 308 PHYS 110 ASTRO 120 EDFON 420 UCC	Invert. Paleo Gen. Physics 1 Star Systems Fnds of Educ	3 4 3 3 3	F B F B	GEOL 460 PHYS 112 ASTRO 122 EDPSY 290 SCI 395	Hydrogeology Gen. Physics 2 Cosmo Life Educ Psychol Int Tch Sci	3 4 3 3 3	S B S B
Senior	Total GEOG 265	Intro. GIS	16 3	F	Total EDSEC 460	St Tch Secon	16	В
Semoi	NREM 221	Soil Resources	3	1.	EDJHM 460 GEOL 480 or	St Tch Jr M	6	В
	GEOL 420 EDSEC 380 EDJHM 385 SCI 396	G P Oceans Prin Sec Sch Prin Mid Sch Sci Mth Mtrl	3 3 3 3	F B B F	GEOG 495		3	В
	Total		18		Total		15	

Total Program: 133 hours

Course Codes

- B: Course offered Fall and Spring semesters, every year
- F: Course offered only Fall semester, every year
 S: Course offered only Spring semester, every year

Schedule C
Four-Year Plan for Combined Middle/Junior and Senior High School Earth/Space Science Education Program

	Fall			Code	Spring			Code
Freshman	UCC		9		UCC		12	
	SCI 150	Basic Concpt	3	F	GEOL 102	Earth Time	3	В
	CHEM 111	Gen. Chem. 1	4	В	CHEM 112	Gen. Chem. 2	4	В
	Total		16		Total		19	
Sophomore	GEOL 220	Earth Materials	3	F	GEOL 207	Environ. Geol	3	S
Sophomore	MATH 112	Trigonometry	3	В	GEOL 240	Geomorph	3	S
	BIO 111	Princ. Bio. 1	4	В	BIO 112	Princ. Bio. 2	4	В
	GEOL 290	GeoComputers	1	F	UCC	1 III.C. DIO. 2	8	D
	EDMUL 205	Multi Educ	3	В	occ		0	
	EDPSY 251	Hu Grow Dev	3	В				
			_					
	Total		17		Total		18	
Junior	GEOL 308	Invert. Paleo	3	F	GEOL 460	Hydrogeology	3	S
	PHYS 110 G	en. Physics 1	4	В	PHYS 112	Gen. Physics 2	4	В
	ASTRO 120	Star Systems	3	F	ASTRO 122	Cosmo Life	3	S
	EDFON 420	Fnds of Educ	3	В	GEOG 230	Elem Meteor	3	В
	UCC		3		EDPSY 290	Educ Psychol	3	В
					SCI 395	Int Tch Sci	3	S
	Total		16		Total		19	
Senior	GEOG 265	Intro. GIS	3	F	EDSEC 460	St Tch Secon	6	В
201101	NREM 221	Soil Resources	3	-	EDJHM 460	St Tch Jr M	6	В
					GEOL 480 or			
	GEOL 420	G P Oceans	3	F	GEOG 495		3	В
	EDSEC 380	Prin Sec Sch	3	В				
	EDJHM 385	Prin Mid Sch	3	В				
	SCI 396	Sci Mth Mtrl	3	F				
	Total		18		Total		15	

Total Program: 138 hours

Course Codes

- B: Course offered Fall and Spring semesters, every year
- F: Course offered only Fall semester, every year
- S: Course offered only Spring semester, every year

Standards:

In order to become an Earth/Space Science teacher you must meet requirements based on standards established at the national level by the Interstate New Teacher Assessment and Support Consortium (INTASC) and the International Society for Technology in Education (ISTE). As an Earth/Space Science teacher you must also meet standards established at the state level by the Indiana Professional Standards Board (IPSB). The courses you take along with certain required experiences and tests are designed to allow you to achieve these standards.

You will learn more about these standards and how to meet them in SCI 150 in the fall of your freshman year.

The INTASC and ISTE standards are available through Teachers College or the Department of Geology. IPSB science standards are available on-line at http://www.state.in.us/psb/future/science.htm.

Decision Points:

As you move through your Ball State Earth/Space Science program you will have to successfully pass four "decision points" that check your progress. The following tables list what you have to do in order to pass each decision point.

Decision Point 1:

Normally students prepare for Decision Point 1 during the freshman year. After passing this point you are known as a *Professional Education Aspirant*.

	Tasks Required to Pass Decision Point 1	Comment
1.	Pass GEOL 101 and GEOG 101 competency exams or successfully complete GEOL 101 and GEOG 101 courses with a grade of at least C- in each course.	Grades will appear on the DAPR.
2.	Pass SCI 150 with a C or better.	Take in fall semester of freshman year.
3.	Acquire knowledge of INTASC and IPSB standards.	Part of SCI 150.
4.	Initiate your electronic portfolio.	Part of SCI 150.
5.	Add to your electronic portfolio at least two performance-based artifacts ¹ from science courses required for Earth/Space Science licensure.	The artifacts will be created in your science courses. The portfolio will be assessed on a Four-point scale (unsatisfactory, basic, proficient, and distinguished) for completeness organization and professional appearance. You must score at the basic level to pass this decision point.

Artifacts in your electronic portfolio will come in different forms. They may be a report you write to describe research you did as part of a science course, a set of lesson plans you create in a science teaching methods course, a video of you teaching science to high school students, and so forth. Artifacts will be added to your portfolio so you can show others that you can do the things that teachers are supposed to be able to do. Each artifact should include the student's work, the instructor's assessment, and a reflective statement written by the student that describes (a) what was learned from the assignment and (b) how the artifact demonstrates mastery of one or more specific science content standards.

Decision Point 2:

Normally students pass Decision Point 2 during the sophomore year. After passing this point you:

- ? are admitted to the Teacher Education Program,
- ? are known as a Professional Education Pre-Candidate, and
- ? may register for 300 and 400 level professional education courses.

	Tasks Required to Pass Decision Point 2	Comment
1.	Pass the PPST, the Pre-Professional Skills Test of reading, writing, and mathematics.	Register for the PPST prior to the start of your sophomore year.
2.	Complete BIO 111*, 112, CHEM 111 and 112*, MATHS 112, GEOL 102, and GEOL 290.	Grades will appear on the DAPR.
3.	Have an overall GPA of at least 2.5 in at least 45 hours.	Your GPA will appear on the DAPR.
4.	Meet ISTE standards at the general preparation level.	These standards will be met as part of the courses you take, particularly GEOL 290.
5.	Sign up to participate in an approved GEOL, GEOG, NREM, ASTRO supplemental instructor (SI) or tutoring activity	See your advisor and appropriate department to sign up.
6.	Have at least five performance-based artifacts from science courses required for Earth/Space Science licensure in your electronic portfolio. Sign up to meet with the Earth/Space Science Review Committee. This meeting will be for portfolio review and your presentation of "Applications of Foundation Sciences in Earth/Space Science." This will be a 3-page outline/report with a 10-15 minute presentation.	The artifacts will be created in your science courses. The instructor's assessment for each artifact must indicate that at least 70% of the available points were received. The portfolio and presentation will be assessed on a Four-point scale (unsatisfactory, basic, proficient, and distinguished) for completeness organization and professional appearance. You must score at the basic level to pass this decision point.
7.	Pass 100 and 200 Professional Education courses with a C or better in each course.	Grades will appear on the DAPR.
8.	Complete Phase One of your Professional Growth Plan.	See general Teachers College handbook.
9.	Approved for admission to the Teaching Curriculum.	See general Teachers College handbook.

^{*} These courses may be required depending on the program option you choose.

Decision Point 3:

You must pass this decision point before you are allowed to student teach. After passing this point you are known as a *Professional Education Candidate*.

	Tasks Required to Pass Decision Point 3	Comment
1.	Be within 9 hrs. of completing all required science content courses.	Grades will appear on the DAPR.
2.	Have a GPA of at least 2.5 in all required science courses for Earth/Space science licensure.	Grades will appear on the DAPR.
3.	Have a C or better in all 300 and 400 level Professional Education courses.	Grades will appear on the DAPR.
4.	Have a GPA of at least 2.5 in all required Professional Education courses.	Grades will appear on the DAPR.
5.	Have a GPA of at least 2.5 in at least 93 hours.	Grades will appear on the DAPR.
6.	Show evidence of participating in approved GEOL, GEOG, NREM, or ASTRO supplemental instructor (SI) or tutoring activities.	Include a letter from the Learning Center or the participating faculty member.
7.	Pass the Ball State University writing competency test.	Register for this test at the start of your junior year in the BSU Assessment office WQ 200.
8.	Complete Phase Two of your Professional Growth Plan.	See general Teachers College handbook.
9.	Meet ISTE standards at the professional preparation level.	These standards will be met as part of the courses you take.
10.	Have at least ten performance-based artifacts from science courses required for Earth/Space science licensure in your electronic portfolio. These artifacts must come from Earth/Space Science courses plus at least one other science discipline.	The committee will assess the science content section of your portfolio and presentation for completeness, organization, and professional appearance. The artifacts will be created in your science and your Science
11.	Have at least three performance-based artifacts from required science methods courses in your electronic portfolio.	Methods courses. The instructor's assessment for each artifact must indicate that at least 70% of the available points were received. The portfolio will be assessed on a Four point and a work of the portfolio will be assessed on a four point and a work of the portfolio will be assessed on a four point and a work of the portfolio will be assessed on a four point and a work of the portfolio will be assessed on a four point and a work of the portfolio will be assessed on a four point and a work of the point of
12	Sign up to meet with the Earth/Space Science Review Committee. This meeting will be for portfolio review and are 10-15 minute content-based presentation.	a Four-point scale (unsatisfactory, basic, proficient, and distinguished) for completeness organization and professional appearance. You must score at the basic level. See your advisor about presentation requirements.

Decision Point 4:

Normally passage of Decision Point 4 is synonymous with graduation. After passing this point you are known as a *Professional Educator*.

	Tasks Required to Pass Decision Point 4	Comment
1.	Have a GPA of at least 2.5 in all required Earth/Space Science courses for Earth/Space Science licensure.	Grades will appear on the DAPR.
2.	Have a GPA of at least 2.5 in all required Professional Education courses.	Grades will appear on the DAPR.
3.	Have a GPA of at least 2.5 in all courses.	Grades will appear on the DAPR.
4.	Pass Student Teaching.	Grade will appear on the DAPR.
5.	Students wishing to be licensed at the high school level in Earth/Space science must pass the PRAXIS II Earth/Space Science exam.	Sign up for this exam the semester before you student teach at the Licensing and Certification Office in TC 903. Preparation for this examination is strongly recommended. Practice booklets are available free of charge in the licensing office.
6.	Students wishing to be licensed at the middle /junior high school level in science must pass the PRAXIS II general science exam.	
7.	Complete Phase Three of your Professional Growth Plan.	See general Teachers College section of this handbook.
8.	Meet ISTE standards at the intern level.	These standards will be met as part of the courses you take.
9.	Complete the Student Teaching Portfolio.	Part of Student Teaching.
10.	Meet all other graduation requirements.	See Ball State University Catalog.

Student Teaching:

Students should apply for student teaching in October of the year prior to that in which they expect to student teach. Applications are available at the Office of Educational Field Experiences in TC 915.

Graduation:

Remember that you are an Earth/Space Science teaching major in the College of Sciences and Humanities, so at commencement go to the designated location for CSH graduates.