BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN EARTH, ENVIRONMENTAL AND PLANETARY SCIENCES

Program Learning Outcomes for the BA Degree with a Major in Earth, Environmental and Planetary Sciences

Upon completing the BA degree with a major in Earth, Environmental and Planetary Sciences, students will be able to:

1. Demonstrate comprehensive knowledge of how the Earth, and also terrestrial planetary systems, operate over geologic and modern timescales.
2. Demonstrate the ability to make and record observations in the field, and to analyze and interpret these data in the context of the geologic history.
3. Demonstrate effective oral and written communication skills.
4. Demonstrate the ability to apply critical thinking and problem-solving skills to evaluate published research in the Earth, Environmental and Planetary sciences.

Requirements for the BA Degree with a Major in Earth, Environmental and Planetary Sciences

For general university requirements, see Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BA degree with a major in Earth, Environmental and Planetary Sciences must complete:

- A minimum of 20 courses (60-63 credit hours, depending on course selection) to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 9 courses (31 credit hours) taken at the 300-level or above.

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major’s academic advisor, or where applicable, the department’s Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major’s Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Earth, Environmental and Planetary Sciences</td>
<td>60-63</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours Required for the BA Degree with a Major in Earth, Environmental and Planetary Sciences</td>
<td>120</td>
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Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>AP/OTH CREDIT IN CALCULUS I</td>
<td></td>
</tr>
<tr>
<td>MATH 102</td>
<td>SINGLE VARIABLE CALCULUS II</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 106</td>
<td>AP/OTH CREDIT IN CALCULUS II</td>
<td></td>
</tr>
<tr>
<td>CHEM 121</td>
<td>GENERAL CHEMISTRY I ¹</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 111</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY I</td>
<td></td>
</tr>
<tr>
<td>CHEM 123</td>
<td>GENERAL CHEMISTRY LABORATORY I ¹</td>
<td>1</td>
</tr>
<tr>
<td>or CHEM 113</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY LAB I</td>
<td></td>
</tr>
<tr>
<td>CHEM 122</td>
<td>GENERAL CHEMISTRY II ¹</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 112</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY II</td>
<td></td>
</tr>
<tr>
<td>CHEM 124</td>
<td>GENERAL CHEMISTRY LABORATORY II ¹</td>
<td>1</td>
</tr>
<tr>
<td>or CHEM 114</td>
<td>AP/OTH CREDIT IN GENERAL CHEMISTRY LAB II</td>
<td></td>
</tr>
</tbody>
</table>

Select 1 course from the following: 3-4

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEPS 101</td>
<td>THE EARTH</td>
<td></td>
</tr>
<tr>
<td>EEPS 107</td>
<td>THE SCIENCE OF CLIMATE CHANGE</td>
<td></td>
</tr>
<tr>
<td>EEPS 108</td>
<td>NATURAL DISASTERS</td>
<td></td>
</tr>
<tr>
<td>EEPS 109</td>
<td>OCEANOGRAPHY</td>
<td></td>
</tr>
<tr>
<td>EEPS 110</td>
<td>THE EARTH SYSTEM, ENVIRONMENT, AND SOCIETY</td>
<td></td>
</tr>
<tr>
<td>EEPS 111</td>
<td>INHABITING PLANET EARTH</td>
<td></td>
</tr>
<tr>
<td>EEPS 115</td>
<td>THE PLANETS</td>
<td></td>
</tr>
<tr>
<td>EEPS 116</td>
<td>THE EARTH AND THE SOLAR SYSTEM</td>
<td></td>
</tr>
<tr>
<td>EEPS 321</td>
<td>EARTH AND PLANETARY SURFACE ENVIRONMENTS</td>
<td>4</td>
</tr>
<tr>
<td>EEPS 322</td>
<td>EARTH AND PLANETARY CHEMISTRY AND MATERIALS</td>
<td>4</td>
</tr>
<tr>
<td>EEPS 323</td>
<td>EARTH AND PLANETARY STRUCTURE AND DYNAMICS</td>
<td>4</td>
</tr>
<tr>
<td>EEPS 325</td>
<td>OCEANS, ATMOSPHERES AND CLIMATE</td>
<td>4</td>
</tr>
<tr>
<td>EEPS 334</td>
<td>THE EARTH LABORATORY</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective Requirements

Directed Electives in Fields Outside Earth, Environmental and Planetary Sciences

Select 2-4 courses from either Group A or Group B: 6-8

Group A

Select 1 from the following: ²

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS 201 &amp; BIOS 202</td>
<td>INTRODUCTORY BIOLOGY I and INTRODUCTORY BIOLOGY II</td>
<td></td>
</tr>
<tr>
<td>PHYS 101 &amp; PHYS 103 &amp; PHYS 102 &amp; PHYS 104</td>
<td>MECHANICS (WITH LAB) and MECHANICS DISCUSSION and ELECTRICITY &amp; MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION</td>
<td></td>
</tr>
<tr>
<td>PHYS 125 &amp; PHYS 126</td>
<td>GENERAL PHYSICS (WITH LAB) and GENERAL PHYSICS II (WITH LAB)</td>
<td></td>
</tr>
</tbody>
</table>

Group B

Select 2 from the following Option Categories:

<table>
<thead>
<tr>
<th>Option Category - 1</th>
</tr>
</thead>
</table>

Select 1 from the following:
PHYS 101 & PHYS 103: MECHANICS (WITH LAB) and MECHANICS DISCUSSION

PHYS 125: GENERAL PHYSICS (WITH LAB)

PHYS 102 & PHYS 104: ELECTRICITY & MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION

PHYS 126: GENERAL PHYSICS II (WITH LAB)

Option Category - 2

BIOS 211 & BIOS 213: INTERMEDIATE EXPERIMENTAL BIOSCIENCES and INTRODUCTORY LAB IN ECOLOGY & EVOLUTION

Option Category - 3

MATH 211: ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA

Option Category - 4

Directed Electives in Earth, Environmental and Planetary Sciences

EEPS 220: INTRODUCTION TO COMPUTATION IN THE EARTH, ENVIRONMENT AND PLANETARY SCIENCES or CAAM 211 (INTRODUCTION TO ENGINEERING COMPUTATION)

Select 4 courses from Environmental, Earth, and Planetary Sciences departmental (EEPS) course offerings at the 300-level or above. 3

Directed Electives in Natural Science and Engineering

Select 2 courses from the School of Natural Sciences or the School of Engineering course offerings at the 200-level or above. 4

Total Credit Hours Required for the Major in Earth, Environmental and Planetary Sciences 60-63

Additional Credit Hours to Complete Degree Requirements * 26-29

University Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/) 3

31

Total Credit Hours 120

Footnotes and Additional Information

* Note: University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying FWIS or distribution requirements may additionally meet other requirements, such as the Analyzing Diversity (AD) requirement, or some of the student’s declared major, minor, or certificate requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.

1 CHEM 121 or CHEM 111 can be satisfied by completing CHEM 151; CHEM 123 or CHEM 113 can be satisfied by completing CHEM 153; CHEM 122 or CHEM 112 can be satisfied by completing CHEM 152; CHEM 124 or CHEM 114 can be satisfied by completing CHEM 154.

2 The Earth, Environmental and Planetary Sciences department has determined that credit awarded for PHYS 141 CONCEPTS IN PHYSICS I and PHYS 142 CONCEPTS IN PHYSICS II is not eligible for meeting the requirements of the Earth, Environmental and Planetary Sciences major.

3 Students may select any course from Earth, Environmental and Planetary Sciences departmental (EEPS) course offerings between course numbers EEPS 300:399, EEPS 407:476, EEPS 495:499 to fulfill the 4 courses (minimum of 12 credit hours) from departmental (EEPS) course offerings.

4 Courses must be approved by the department undergraduate advisor. Courses from the School of Natural Sciences or the School of Engineering include the following subject codes: ASTR, BIOS, BIOE, CAAM, CEVE, CHBE, CHEM, COMP, DSCI, EEPS, ELEC, ENGI, ENST, GLHT, HEAL, KINE, MATH, MECH, MSNE, NEUR, NSCI, PHYS, STAT.

Policies for the BA Degree with a Major in Earth, Environmental and Planetary Sciences

Program Restrictions and Exclusions

Students pursuing the BA Degree with a Major in Earth, Environmental and Planetary Sciences should be aware of the following program restrictions:

- As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), under Declaring Majors, Minors and Certificates, students may not obtain both a BA and a BS in the same major. Students pursuing the BA Degree with a Major in Earth, Environmental and Planetary Sciences may not additionally pursue the BS Degree with a Major in Earth, Environmental and Planetary Sciences.

- As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), students may not major and minor in the same subject.

Transfer Credit

For Rice University’s policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have additional restrictions on transfer credit. The Office of Academic Advising maintains the university’s official list of transfer credit advisors (https://oaa.rice.edu/advising-network/transfer-credit-advisors/) on their website: https://oaa.rice.edu/. Students are encouraged to meet with their academic program’s transfer credit advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the major in Earth, Environmental and Planetary Sciences should be aware of the following departmental transfer credit guidelines:

- Requests for transfer credit will be considered by the program director (and/or the program’s official transfer credit advisor) on an individual case-by-case basis.

Additional Information

For additional information, please see the Earth Environmental and Planetary Sciences major page, on the Department of Earth, Environmental and Planetary Sciences website: https://earthscience.rice.edu/academics/undergraduate-program/
Opportunities for the BA Degree with a Major in Earth, Environmental and Planetary Sciences

Academic Honors
The university recognizes academic excellence achieved over an undergraduate’s academic history at Rice. For information on university honors, please see Latin Honors (https://qa.rice.edu/undergraduate-students/honors-distinctions/university/) (summa cum laude, magna cum laude, and cum laude) and Distinction in Research and Creative Work (https://qa.rice.edu/undergraduate-students/honors-distinctions/university/). Some departments have department-specific Honors awards or designations.

Undergraduate Independent Research
The department encourages, but does not require, Earth, Environmental and Planetary Sciences (EEPS) undergraduate majors to pursue independent supervised research in EEPS 481. This can also be carried out as part of the Earth, Environmental and Planetary Sciences Honors Thesis Program (described below), or independently with a faculty mentor. Undergraduates enrolled in the Honors Research program automatically will be eligible for consideration for the university honor, the Distinction in Research and Creative Work (https://qa.rice.edu/undergraduate-students/honors-distinctions/university/). Other students who wish to be considered for this honor within the EEPS majors should discuss with an EEPS major advisor at the beginning of their senior year.

Honors Research
Undergraduates are encouraged to embark on an undergraduate honors thesis. The purpose of the honors thesis is for students to develop and demonstrate their creative and independent research potential. Students are recommended to begin in the fall of their junior year to provide ample time for research projects to be developed, executed and written. Students are expected to enroll in at least two semesters of the course EEPS 481, spanning their senior year. Juniors who have identified a research project and mentor can also enroll in EEPS 481. Students should sign up for EEPS 481 for 3 credit hours.

Criteria for Participating in Undergraduate Honors Thesis Research
- Strong performance in EEPS courses, in particular, EEPS 321, EEPS 322, EEPS 323, EEPS 325, and EEPS 334
- Letter of recommendation of a faculty research mentor
- Brief research proposal

Requirements and Recommendations for Completing an Undergraduate Honors Thesis
Spring Semester of Junior Year
Students are encouraged to choose their honors thesis research topic during their junior year. Each candidate should identify a faculty research advisor, and initiate independent research. The student should select a thesis committee, consisting of a faculty advisor, one member of the honors thesis committee, and one other faculty member of their choosing. By the end of their spring semester, candidates are expected to turn in a preliminary written proposal (2 pages), accompanied by a formal application, both of which will be evaluated by the honors thesis committee for consideration of acceptance into the honors thesis program in their senior year. Recommended courses:

Code | Title | Credit Hours
--- | --- | ---
EEPS 401 | SEMINAR: UNDERGRADUATE HONORS THESIS | 1

If they have already identified a research project by the beginning of the semester, they may also take:

Code | Title | Credit Hours
--- | --- | ---
EEPS 481 | UNDERGRADUATE RESEARCH IN EARTH SCIENCE | 1-6

Fall Semester of Senior Year
Students accepted into the honors thesis program continue to develop and refine their proposed research in concert with their research advisor and thesis committee. Students participate in meetings with other honors thesis candidates to discuss basic research protocols and philosophies, and meet independently with their chosen scientific advisor, and generate data, experiments or models. Students will give oral presentations of their research proposals in public by mid-semester, in the presence of their examining committee. At the end of the semester, students must submit final versions of their proposals, describing motivation, hypothesis, methodology, and preliminary results. The honors thesis committee will evaluate the proposals, and if approved, students can continue in the honors thesis program. Required courses:

Code | Title | Credit Hours
--- | --- | ---
EEPS 401 | SEMINAR: UNDERGRADUATE HONORS THESIS | 1
EEPS 481 | UNDERGRADUATE RESEARCH IN EARTH SCIENCE | 1-6

Spring Semester of Senior Year
Students continue and complete their research. A mid-semester progress report must be submitted to the thesis committee for feedback. At the end of the spring semester, students submit their final theses, and give public oral exit talks. To complete the honors thesis program, student theses must be approved by the honors thesis committee. Required courses:

Code | Title | Credit Hours
--- | --- | ---
EEPS 401 | SEMINAR: UNDERGRADUATE HONORS THESIS | 1
EEPS 481 | UNDERGRADUATE RESEARCH IN EARTH SCIENCE | 1-6

Further details about the program, and expectations and criteria for the thesis proposal and final thesis can be found on the Department of Earth, Environmental and Planetary Sciences website (https://earthscience.rice.edu/academics/undergraduate-program/honors-thesis/).

Application Process
Students must apply and be accepted to participate in the senior honors research program. The application form can be downloaded from Department of Earth, Environmental and Planetary Sciences website (https://earthscience.rice.edu/academics/undergraduate-program/honors-thesis/), and should be submitted along with an approximately
two page thesis proposal at the end of the spring semester of the junior year.

**Other Points of Consideration**
Students who are accepted into the 'RUSP: Rice Undergraduate Scholars Program' can substitute EEPS 481 courses for semesters 2 and 3 with HONS 470 and HONS 471. However, the students will have to meet all other requirements of the honors thesis set by the department.

**Additional Information**
For additional information, please see the Earth, Environmental and Planetary Sciences major page, on the Department of Earth, Environmental and Planetary Sciences website: https://earthscience.rice.edu/academics/undergraduate-program/