University of Hawai'i
Code Request Form for Academic Programs

NEW OR REPLACE PROGRAM CODE

☑ **New Program Code** ☐ **Replace Program Code** Date: March 13, 2023

REQUESTOR CONTACT INFORMATION

Name	Pheng Xiong	Campus	UH Manoa
Title	University Registrar	Email	pxiong@hawaii.edu
Office/Dept	Office of the Registrar	Phone	808-956-5322

NEW PROGRAM CODE TO CREATE

Institution	UH Manoa	Campus	UH Manoa
Level	Undergraduate	Effective Term	Fall 2023

	Code (Max. Characters)		Description	Check if requesting new code:	
College	(2)	11	SOEST	☐	See Banner form STVCOLL
Department	(4)	ERTH	Earth Sciences	☐	See Banner form STVDEPT
Degree/Certificate	(6)	BA	Bachelor of Arts	☐	See Banner form STVDEGC
Major	(4)	EES	Environmental Earth Sciences	☐	See Banner form STVMAJR
Concentration	(4)	EESG	General	☑	See Banner form STVMAJR
Minor	(4)			☐	See Banner form STVMAJR

If a similar major/concentration code exists in Banner, please list the code:

Justification to warrant a new major/concentration code similar to an existing major/concentration code:

Is this major/concentration code being used the same way at the other UH campuses?	☐ Yes	☑ No
Should this program be available for applicants to select as their planned course of study on the online application? *If yes, student may select the code as their only program of study.*	☐ Yes	☑ No

RULES PERTAINING TO FINANCIAL AID AND 150% DIRECT SUBSIDIZED LOAN LIMIT LEGISLATION

Is 50% or greater of the classes in this program offered at a location other than the Home Campus?	☐ Yes	☑ No
Is this program/major/certificate financial aid eligible?	☑ Yes	☐ No
Does this certificate qualify as a Gainful Employment Program (Title IV-eligible certificate program)? *See http://www.ifap.ed.gov/GainfulEmploymentInfo/index.html*	☐ Yes	☐ No

Program Length
In academic years; decimals are acceptable. The length of the program should match what is published by the campus in any online and/or written publication. 4.0

Special Program Designations ☐ A ☐ B ☐ N ☐ P ☐ T ☐ U
See Special Program Designations Code Definitions on IRAO Program Code Request webpage

Required Terms of Enrollment: ☑ Fall ☑ Spring ☐ Summer ☐ Extended

Form modified: Oct 20208

University of Hawai'i
Code Request Form for Academic Programs

NEW OR REPLACE PROGRAM CODE

EXISTING PROGRAM CODE TO REPLACE, IF APPLICABLE

Program Code		Program Description	
Institution		Campus	UH Manoa
College		Department	
Level			

Are current students "grandfathered" under the program code? ☐ Yes ☐ No

Should the old program code be available for use in Banner? ☐ Yes ☐ No

Effective _____ **, old program code will no longer be available to admit or recruit students.**
Term (ie. Fall 2020)

This will turn off the online application, recruitment (effects Banner forms SRASUMI and SRAQUIK) and admissions (effects Banner forms SAADCRV, SAAADMS, SAASUMI, SAAQUIK, and SAAQUAN) Banner modules.

Effective _____ **, old program code will no longer be available to award degree to students.**
Term (ie. Fall 2020)

This will turn off the general student (effects Banner form SGASTDN) and academic history (effects Banner form SHADEGR) Banner modules.

ATTACHMENTS

BOR Approved: Sole-credential Certificate, Associate, Bachelor and Graduate Degrees, and sole credential certificates

☐ BOR Meeting Minutes & Supporting Documents ☐ Curriculum

Chancellor Approved: Concentrations, Certificates and Associate in Technical Studies (ATS) Degree

☐ Memo from Chancellor to notify Vice President for Academic Planning and Policy regarding program action.

☒ Curriculum

CERTIFICATES ONLY: Please check one (1) statement. This certificate is a...

☐ BOR approved certificate. BOR Meeting/Approval Date: _____

☐ Chancellor approved within an authorized BOR program. BOR Program: _____

☐ Chancellor approved CO in accordance with UHCCP 5.203, Section IV.B.10.

VERIFICATIONS

By signing below, I verify that I have reviewed and confirm the above information that is pertinent to my position.

Registrar (Print Name)	**Financial Aid Officer** (Print Name)	**For Community Colleges, verification of consultation with OVPCC Academic Affairs:**
Pheng Xiong	Jodie Kuba	Tammi Oyadomari-Chun
Digitally signed by Pheng Xiong Date: 2023.03.13 06:53:56 -10'00'	Digitally signed by Jodie Kuba Date: 2023.03.13 10:08:24 -10'00'	
Signature Date	Signature Date	Signature Date

ADDITIONAL COMMENTS

No change in CIP.

Form modified: Oct 2020

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology
Department of Earth Sciences

MEMORANDUM

February 22, 2023

TO: Laura E. Lyons
Interim Vice Provost of Academic Excellence

VIA: Charles Fletcher
Interim Dean, SOEST

FROM: Garrett Ito
Chair, Dept. of Earth Sciences

Garrett Apuzen-Ito

SUBJECT: Approval of changes to Earth Sciences BA in Environmental Earth Science and BA in Environmental Earth Science - Earth Science Education track ✓

SPECIFIC ACTION REQUESTED:
It is requested that the two modifications described below be approved. First, we are requesting that the BA in Environmental Earth Science become a track, named the BA in Environmental Earth Science – General track. Second, we are requesting changes in the required courses and electives for both tracks (General and Earth Science Education).

REQUESTED EFFECTIVE TERM: Fall 2023

ADDITIONAL COST: The proposed modifications are cost-neutral, requiring no additional resources from the University.

RATIONALE/PURPOSE OF PROPOSED CHANGE(S):
We are currently revising numerous aspects of the Earth Sciences Curricula, both our BA in Environmental Earth Science and our BS in Earth and Science (approval of the BS changes will be requested in a separate memo). Currently, we have a BA degree program called Environmental Earth Science, and a single track associated with this degree – Earth Science Education. This setup has produced confusion for a long time among faculty and students, so we are requesting that the BA in Environmental Earth Science become a track as well (called the General track). Thus, the BA degree will be composed of two equal-footing tracks.

Additionally, we would like to make curricular changes to both BA tracks. The proposed curricular redesign is the product of two years of discussion and development by the faculty of the Department of Earth Sciences. Enrollment in our BA in Environmental Earth Science (largely in the General track) has increased considerably, jumping from 3 to 17 to 30 to 44 new students in the Fall semesters of 2019, 2020, 2021, and 2022, respectively. However, the numbers would be even better if we could increase retention. Students who left our degree stated that the main reason for leaving was a lack of strong environmental focus in the early courses. Our changes address this. Other changes will prepare these BA students better for upper-division courses as well as allowing students to better visualize themselves as practicing geoscientists— for example, an environmental resource specialist working for the DLNR, a field geologist with a local geotechnical engineering firm, a coastal specialist for the State Dept. of Transportation, or a technician at the Hawaiian Volcano Observatory. For the BS program, we will be defining formal concentrations. However, for the BA General track we opted instead for curated sets of elective courses in topical areas of high relevance to Hawai'i: Coastal Science, Geotechnical Training, and Geologic Hazards. These sets will be advertised on the departmental website and communicated to students during advising meetings. The initial response to the elective sets from current General-track BA students during the Spring 2022 mandatory student advising season was very positive, providing anecdotal evidence that students appreciate the career guidance afforded by the sets.

Proposed changes to the Earth Science Education track are intended to keep these students with their peers in the General track as long as possible and to provide as much Earth Science content as possible. We also made changes to suggested General Education courses to increase consistency with the General track as well as with the revisions we will request for the BS.

1680 East-West Rd., Honolulu, Hawai'i 96822
Tel. (808) 956-7640, Fax (808) 956-5512

DETAILED LIST OF CHANGE(S) TO THE BA IN ENVIRONMENTAL EARTH SCIENCE (GENERAL TRACK):

1. We re-named this as a track.

2. Requirements: We changed the number of credits in various categories and included mention of the unofficial concentrations (Coastal Science, Geotechnical Training, and Geologic Hazards) that can be achieved via curated sets of electives.

3. Earth Science and Other Courses, Required Courses: We changed the number of credits from 27 to 36-37 (the range is explained below). We removed references to ERTH 170 because we have not offered it for a long time and do not anticipate it being taught in the near future. The Department. is currently developing ERTH 201 (Climate Change), a 3-credit course that will be an alternative requirement for ERTH 200 (which is 4 credits), although we hope that students will take both. The fact that they are not the same number of credits is the reason why the number of credits will vary. We added ERTH 303 and 333, both of which contain material that is fundamental to students' geological and geophysical knowledge. Additionally, some of the material that was in ERTH 200 is now covered in ERTH 333, freeing up time in ERTH 200 for more environmental topics. Note that ERTH 303 has a new title and catalog description – the UHM-2 form is being prepared separately. We replaced ERTH 325 (Geochemistry) with ERTH 425 (Environmental Geochemistry), and we added TPSS 304 (Introduction to Soil Science). Both of these changes will sharpen the environmental focus of the BA degree. In fact, a frequent comment from our graduates I the workforce is that they wish they'd taken a course in Soil Science. We discussed this matter with Jonathan Deenik, the TPSS 304 instructor, who expressed willingness to have our students in the course. However, students in TPSS 304 are required to be co-registered in TPSS 304L and the TPSS 304L instructor cannot accommodate many students from outside of CTAHR. Dr. Deenik agreed to waive the co-requisite requirement for our students.

4. Earth Science and Other Courses, Upper Division Science Electives: We changed the number of elective credits from 15 to 9 but have increased the choices available to satisfy upper-division electives. We added the curated sets of electives for the Coastal Science, Geotechnical Training, and Geologic Hazards topic areas.

5. Earth Science and Other Courses, Required Support Courses: We added courses to the Biological Sciences list and removed GES 102 because it is the same as OCN 102.

DETAILED LIST OF CHANGE(S) TO THE BA IN ENVIRONMENTAL EARTH SCIENCE (EARTH SCIENCE EDUCATION TRACK):

The Earth Science Education track is a 4-year BA track that started in 2015-2016 for students who plan to become Earth Science teachers at local public schools. It was developed with only informal consultation with the College of Education, which is likely why very few students have opted to sign up for it. With a lot of help from the College of Education, we recently converted the BAESE into a 4+1 program with the College of Education that will allow a student to receive both the BAESE and a Post-Baccalaureate Certificate in Teacher Education in 5 years.

1. We changed the first paragraph of the catalog description to indicate that this BA is the first part of a 5-year program. In the second paragraph we changed the numbers of credits in various categories and indicated that there are some Education courses within the BA part of the degree. Finally, we added text indicating that it is possible to opt out of the Post-Baccalaureate portion of the degree and receive only the BA in Environmental Earth Science – Earth Science Education.

2. Earth Science and Other Courses (Required Courses): We changed the number of credits from 39 to 49 or 48 (again with the range explained below). We removed references to ERTH 170 because we have not offered it for a long time and do not anticipate it being taught in the near future. The Department. is currently developing ERTH 201 (Climate Change), a 3-credit course that will be an alternative requirement for ERTH 200 (which is 4 credits), although we hope that students will take both. The fact that they are not the same number of credits is the reason why the number of credits will vary. We replaced ERTH 300 with ERTH 333. The Earth Sciences Department. decided that ERTH 333 (Earth Materials and Structure), which covers a broad range of important geologic topics, is more appropriate for future teachers than ERTH 300 (Volcanology). We added EDEF 310 and EDEP 311, removed ERTH 406 (the instructor has retired), changed the name of ITE 401 (the code is now STE), and added STE 402N and STE 440. We added a note that if a student opts to not pursue the PBCTE, s/he can replace all the Education courses with Science electives and thereby only receive the BA in Environmental Earth Sciences – Earth Science Education.

3. Earth Science and Other Courses (Upper Division Science Electives): We changed the number of credits from 5 to 18. We also broadened the list of approved upper division courses that can be taken.

4. Earth Science and Other Courses (Required Support Courses): We changed the number of credits from 25 to 29. We corrected the name of BIOL 171 and added BIOL 172 and 172L.

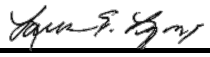
DETAILED LIST OF CONSULTATION WITH IMPACTED PROGRAMS:
This change was approved by all parties involved in developing the 4+1 program. These changes affect only the Earth Sciences portion of the degree, not the Education portion. TPSS 304 is among the potential Science electives and as noted above, the instructor for the course is open to our students enrolling. James Potemra, the instructor for OCN 310, is willing to accept a small number of Earth Science Education students into his (non-W-focus) section of the course.

ACTION RECOMMENDED:
It is recommended that the changes listed above be approved.

ATTACHMENTS (1-5 REQUIRED):

1. Current Program Sheet (BA in Environmental Earth Science)
2. Proposed Program Sheet (BA in Environmental Earth Science: General Track with proposed changes in Red)
3. Current Program Sheet (BA in Environmental Earth Science: Earth Science Education Track)
4. Proposed Program Sheet (BA in Environmental Earth Science: Earth Science Education Track with proposed changes in Red)
5. Current Plan Templates
6. Proposed Plan Templates (with proposed changes in Red)
7. Current Catalog Description
8. Proposed Catalog Description (with proposed changes in Red)

APPROVED/DISAPPROVED:



3 March 2023

Laura E. Lyons — Date
Interim Vice Provost for Academic Excellence

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2022-2023
Bachelor of Arts (BA) in Environmental Earth Science Current Program Sheet
Admissions: Open Process: Declaration
Min. Total Credits: 120 (87 in core & major + 33 in electives)

UHM General Education Core Requirements
Foundations
❑ FW ENG 100, 100A, 190, ESL 100, or AMST 111
❑ FQ* MATH 241 or 215
❑ FG (A / B / C)
❑ FG (A / B / C)
**Note: This requirement changed in Fall 2018. If you entered the UH System prior to that, please see your college/school advisor.*
Diversification
❑ DA / DH / DL
❑ DA / DH / DL
❑ DB BIOL 171, ZOOL 101, GES 102, MICR 130, BOT 101, or OEST 103
❑ DP ERTH 101, 103, 104, 106, 130
❑ DY ERTH 101L
❑ DS
❑ DS
** See degree, college and major requirements for courses that can also fulfill these.*

UHM Graduation Requirements
Focus
❑ H
❑ E (300+)
❑ O (300+)
❑ W
❑ W
❑ W
❑ W (300+)
❑ W (300+)
Hawaiian / Second Language
The Hawaiian or Second Language requirement is **not** required for students admitted to the School of Ocean and Earth Science and Technology.
Credit Minimums
• 120 total applicable
• 30 in residence at UHM
• 45 upper division (300+ level) credits
Grade Point Average
• 2.0 cumulative or higher
• Good academic standing

Degree Requirements
Bachelor of Arts: Math and Science Requirements
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ CHEM 161*[DP] / ❑ 161L*[DY]
❑ CHEM 162 / ❑ 162L
❑ PHYS 151 / ❑ 151L
❑ PHYS 152 / ❑ 152L
College Requirements
Exit Requirements
• Submit the Graduation Worksheet to the SOEST Student Academic Services Office at least two semesters preceding the award of the degree.
• Exit interview by SOEST Student Academic Services Office.

This program sheet was prepared to provide information and does not constitute a contract. See back for major requirements. Meet regularly with your major advisor.

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2022-2023
Bachelor of Arts (BA) in Environmental Earth Science Current Program Sheet
Admissions: Open Process: Declaration
Min. Total Credits: 120 (87 in core & major + 33 in electives)

Major Requirements for BA in Environmental Earth Science
Admission: Open
Application: NA
Min. major credits: 42 (66 with required support courses)
Min. C grade (not C-) in all courses
Requirements
Environmental Earth Science Required Support Course (24 credits)
❑ BIOL 171*[DB], BOT 101*[DB], GES 102*[DB], MICR 130*[DB], OEST 103*[DB], OCN 102*[DB], or ZOOL 101*[DB]
❑ CHEM 161*[DP] / ❑ 161L*[DY]
❑ CHEM 162 / ❑ 162L
❑ PHYS 151 / ❑ 151L
❑ PHYS 152 / ❑ 152L
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ OEST 100
Environmental Earth Science Core Courses (27 credits)
❑ ERTH 170, or ERTH 101/101L, or ERTH 103/101L, or ERTH 104/101L, or ERTH 106/101L, or ERTH 130/101L
❑ ERTH 200 *(Spring only)*
❑ ERTH 305 *(Spring only)*
❑ ERTH 309 *(Spring only)*
❑ ERTH 325 *(Fall only)*
❑ ERTH 410 *(Fall only)*
❑ ERTH 455 *(Spring only)*
❑ ERTH 461 *(Fall only)*
Environmental Earth Science Electives (15 credits)
❑ _____ ❑ _____ ❑ _____
❑ _____ ❑ _____
List of approved upper division science electives: Any upper division ERTH course; GEO 388; NREM 477; OCN 320; TPSS 304. Consult with an undergraduate advisor for details.

Notes
School of Ocean and Earth Science and Technology: Student Academic Services, Director of Student Services: Heather Saito; HIG 131B; (808) 956-8763; hsaito2@hawaii.edu; https://www.soest.hawaii.edu/soestwp/education/undergraduate/advising/ Department of Earth Sciences; POST 701; (808) 956-7640; earth-dept@soest.hawaii.edu; www.soest.hawaii.edu/earthsciences

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science:
Track: General
Admissions: Open Process: Declaration
Min. Total Credits: 120 (~~87~~ 91 in core & major + ~~33~~ 29 in electives)

Proposed Program Sheet

UHM General Education Core Requirements
Foundations
❑ FW ENG 100, 100A, 190, ESL 100, or AMST 111
❑ FQ* MATH 241 or 215
❑ FG (A / B / C)[1]
❑ FG (A / B / C)[1]
**Note: This requirement changed in Fall 2018. If you entered the UH System prior to that, please see your college/school advisor.*
[1]OCN 105 and ERTH 135 recommended.
Diversification
❑ DA / DH[2] / DL
❑ DA / DH / DL
❑ DB[3] BIOL 171, ZOOL 101, ~~GES~~ OCN 102, MICR 130, BOT 101, or OEST 103
❑ DP ERTH 101, 103, 104, 106, 130
❑ DY ERTH 101L
❑ DS
❑ DS
** See degree, college and major requirements for courses that can also fulfill these.*
[2]HWST 107 recommended
[3]OCN 102 recommended; other accepted DB courses are BE 120; BIOL 171; BOT 101; MICR 130; NREM 210, 251; OEST 103; ZOOL 101, 200; BIOC 441
UHM Graduation Requirements
Focus
❑ H
❑ E (300+)
❑ O (300+)
❑ W
❑ W
❑ W (300+)
❑
❑ W (300+)
❑
Hawaiian / Second Language
The Hawaiian or Second Language requirement is **not** required for students admitted to the School of Ocean and Earth Science and Technology.
Credit Minimums
120 total applicable
• 30 in residence at UHM
• 45 upper division (300+ level) credits
• **Grade Point Average**
2.0 cumulative or higher
• Good academic standing
• Good academic standing

Degree Requirements
Bachelor of Arts: Math and Science Requirements
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ CHEM 161*[DP] / ❑ 161L*[DY]
❑ CHEM 162 / ❑ 162L
❑ PHYS 151 / ❑ 151L
❑ PHYS 152 / ❑ 152L
College Requirements
Exit Requirements
• Submit the Graduation Worksheet to the SOEST Student Academic Services Office at least two semesters preceding the award of the degree.
• Exit interview by SOEST Student Academic Services Office.

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science
Track: General
Admissions: Open Process: Declaration
Min. Total Credits: 120 (~~87~~ 91 in core & major + ~~33~~ 29 in electives)

Major Requirements for BA in Environmental Earth Science
Admission: Open
Application: NA
Min. major credits: ~~42~~ 45-47 (~~66~~ 69-72 with required support courses)
Min. C grade (not C-) in all courses
Requirements
Environmental Earth Science Required Support Course (24~~-25~~ credits)
❑ BE 120*[DB], BIOC 441*[DB], BIOL 171*[DB], BOT 101*[DB], ~~GES 102*[DB]~~, MICR 130*[DB], NREM 210*[DB], NREM 251*[DB], OEST 103*[DB], OCN 102*[DB], or ZOOL 101*[DB], ZOOL 200*[DB]
❑ CHEM 161*[DP] / ❑ 161L*[DY]
❑ CHEM 162 / ❑ 162L
❑ PHYS 151 / ❑ 151L
❑ PHYS 152 / ❑ 152L
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ OEST 100
Environmental Earth Science and other Core Courses (~~27~~ 36-38 credits)
❑ ~~ERTH 170, or~~ ERTH 101/101L, or ERTH 103/101L, or ERTH 104/101L, or ERTH 106/101L, or ERTH 130/101L
❑ ERTH 200 *(Spring only)* or ERTH 201 *(Fall only)*
❑ ERTH 303 *(Fall only)*
❑ ERTH 305 *(Spring only)*
❑ ERTH 309 *(Spring only)*
❑ ERTH 333 *(Fall only)*
❑ ERTH ~~325~~ 425 *(~~Fall~~ Spring only)*
❑ ERTH 410 *(Fall only)*
❑ ERTH 455 *(~~Spring~~ Fall only)*
❑ ERTH 461 *(Fall only) or GEO 388 or NREM 477*
❑ TPSS 304 (*Fall only*)
~~Environmental Earth~~ Science Electives (~~15~~ 9 credits)
❑ ❑ ❑
List of approved upper division science electives: Any upper division ~~ERTH course; GEO 388; NREM 477; OCN 320; TPSS 304. Consult with an undergraduate advisor for details.~~ ERTH, EPET, ATMO, or OCN course, plus GEO 370, 405; NREM 301, 302; PEPS 451; PLAN 414; POLS 380. For students interested in Coastal Geology, Geotechnical Training, or Geologic Hazards, please see your advisor for the appropriate curated list(s) of electives.

University of Hawai‘i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science
Track: General
Admissions: Open Process: Declaration
Min. Total Credits: 120 (~~87~~ 91 in core & major + ~~33~~ 29 in electives)

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science
Track: Earth Science Education Current Program Sheet
Admissions: Open Process: Declaration
Min. Total Credits: 120 (90 in core & major + 30 in electives)

UHM General Education Core Requirements
Foundations
❑ FW ENG 100, 100A, 190, ESL 100, or AMST 111
❑ FQ* MATH 241 or 215
❑ FG (A / B / C)
❑ FG (A / B / C)
**Note: This requirement changed in Fall 2018. If you entered the UH System prior to that, please see your college/school advisor.*
Diversification
❑ DA / DH / DL
❑ DA / DH / DL
❑ DB BIOL 171
❑ DP ERTH 101, 103, 104, 106, 130
❑ DY ERTH 101L
❑ DS
❑ DS
** See degree, college and major requirements for courses that can also fulfill these.*

UHM Graduation Requirements
Focus
❑ H
❑ E (300+)
❑ O (300+)
❑ W
❑ W
❑ W
❑ W (300+)
❑ W (300+)
Hawaiian / Second Language
The Hawaiian or Second Language requirement is **not** required for students admitted to the School of Ocean and Earth Science and Technology.
Credit Minimums
• 120 total applicable
• 30 in residence at UHM
• 45 upper division (300+ level) credits
Grade Point Average
• 2.0 cumulative or higher
• Good academic standing

Degree Requirements
Bachelor of Arts: Math and Science Requirements
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ BIOL 171*[DB] / ❑ 171L
❑ CHEM 161 / ❑ 161L
❑ CHEM 162 / ❑ 162L
❑ PHYS 151*[DP] / ❑ 151L*[DY]
❑ PHYS 152 / ❑ 152L
College Requirements
Exit Requirements
• Submit the Graduation Worksheet to the SOEST Student Academic Services Office at least two semesters preceding the award of the degree.
• Exit interview by SOEST Student Academic Services Office.

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science
Track: Earth Science Education Current Program Sheet
Admissions: Open Process: Declaration
Min. Total Credits: 120 (90 in core & major + 30 in electives)

Major Requirements for BA in Environmental Earth Science: Earth Science Education
Specialization: Earth Science Education
Admission: Open
Application: NA
Min. major credits: 27 (69 with required support courses)
Min. C grade (not C-) in all courses
Requirements
Environmental Earth Science Required Support Course (25 credits)
❑ BIOL 171*[DB]/ ❑ 171L
❑ CHEM 161 / ❑ 161L
❑ CHEM 162 / ❑ 162L
❑ PHYS 151*[DP] / ❑ 151L*[DY]
❑ PHYS 152 / ❑ 152L
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ OEST 100
Environmental Earth Science Core Courses (39 credits)
❑ ERTH 170, ERTH 101 /101L, or ERTH 103 /101L, or ERTH 104/101L, or ERTH 106 /101L, or ERTH 130/101L
❑ ERTH 105 or ASTR 110
❑ ERTH 200 *(Spring only)*
❑ ERTH 300
❑ ERTH 305 *(Spring only)*
❑ ERTH 406
❑ ERTH 410 *(Fall only)*
❑ ATMO 101 / ❑ ATMO 101L
❑ ATMO 200
❑ OCN 201/ ❑ 201L
❑ OCN 310 *(Fall only)*
❑ ITE 401
Environmental Earth Science Upper Division Science Electives (5 credits)
❑ _____
❑ _____
List of approved upper division science electives: any upper division ERTH course; GEO 405; NREM 477; OCN 320, 331, 457; TPSS 304
Notes

University of Hawai‘i at Mānoa

School of Ocean and Earth Science and Technology Program Sheet 2023-2024

Bachelor of Arts (BA) in Environmental Earth Science

Track: Earth Science Education Current Program Sheet

Admissions: Open Process: Declaration

Min. Total Credits: 120 (90 in core & major + 30 in electives)

School of Ocean and Earth Science and Technology: Student Academic Services, Director of Student Services: Heather Saito; HIG 131B; (808) 956-8763; hsaito2@hawaii.edu; https://www.soest.hawaii.edu/soestwp/education/undergraduate/advising/
Department of Earth Sciences; POST 701; (808) 956-7640; earth-dept@soest.hawaii.edu; www.soest.hawaii.edu/earthsciences

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science
Track: Earth Science Education Proposed Program Sheet
Admissions: Open Process: Declaration
Min. Total Credits: 120 (~~90~~ 105 in core & major + ~~30~~ 15 in electives)

UHM General Education Core Requirements
Foundations
❑ FW ENG 100, 100A, 190, ESL 100, or AMST 111
❑ FQ* MATH 241 or 215
❑ FG (A / B / C)[1]
❑ FG (A / B / C)[1]
**Note: This requirement changed in Fall 2018. If you entered the UH System prior to that, please see your college/school advisor. [1]OCN 105 and ERTH 135 are recommended*
Diversification
❑ ~~DA /~~ DH[2] ~~/ DL~~
❑ DA ~~/ DH~~ / DL
❑ DB BIOL 171
❑ DP ERTH 101, 103, 104, 106, 130
❑ DY ERTH 101L
❑ DS EDEF 310[3]
❑ DS EDEP 311[3]
** See degree, college and major requirements for courses that can also fulfill these. [2]HWST 107 recommended [3]Students not pursuing the BAP in Earth Science Education/Post Baccalaureate Certificate in Teacher Education may replace these courses with other DS courses.*
UHM Graduation Requirements
Focus
❑ H
❑ E (300+)
❑ O (300+)
❑ W
❑ W
❑ W
❑ W (300+)
❑ W (300+)
Hawaiian / Second Language
The Hawaiian or Second Language requirement is **not** required for students admitted to the School of Ocean and Earth Science and Technology.
Credit Minimums
• 120 total applicable
• 30 in residence at UHM
• 45 upper division (300+ level) credits
Grade Point Average
• 2.0 cumulative or higher
• Good academic standing

Degree Requirements
Bachelor of Arts: Math and Science Requirements
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ BIOL 171*[DB] / ❑ 171L
❑ BIOL 172 / ❑ 172L
❑ CHEM 161 / ❑ 161L
❑ CHEM 162 / ❑ 162L
❑ PHYS 151*[DP] / ❑ 151L*[DY]
❑ PHYS 152 / ❑ 152L
College Requirements
Exit Requirements
• Submit the Graduation Worksheet to the SOEST Student Academic Services Office at least two semesters preceding the award of the degree.
• Exit interview by SOEST Student Academic Services Office.

This program sheet was prepared to provide information and does not constitute a contract. See back for major requirements. Meet regularly with your major advisor.

University of Hawai'i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science
Track: Earth Science Education Proposed Program Sheet
Admissions: Open Process: Declaration
Min. Total Credits: 120 (~~90~~ 105 in core & major + ~~30~~ 15 in electives)

Major Requirements for BA in Environmental Earth Science: Earth Science Education
Specialization: Earth Science Education
Admission: Open
Application: NA
Min. major credits: 60-61 ~~27~~ (89-90 ~~69~~ with required support courses)
Min. C grade (not C-) in all courses
Requirements
Environmental Earth Science Required Support Courses (~~25~~ 29 credits)
❑ BIOL 171*[DB]/ ❑ 171L
❑ BIOL 172/ ❑ 172L
❑ CHEM 161 / ❑ 161L
❑ CHEM 162 / ❑ 162L
❑ PHYS 151~~*[DP]~~ / ❑ 151L~~*[DY]~~
❑ PHYS 152 / ❑ 152L
❑ MATH 241*[FQ] or MATH 215*[FQ]
❑ OEST 100
Environmental Earth Science and other Core Courses (~~39~~ 48-49 credits)
~~❑ ERTH 170,~~ ERTH 101~~/101L~~, or ERTH 103~~/101L~~, or ERTH 104/~~101L~~, or ERTH 106 ~~/101L~~, or ERTH 130~~/101L~~
❑ ERTH 101L*[DY]
❑ ERTH 105 or ASTR 110
❑ ERTH 200 *(Spring only)* or ERTH 201 *(Fall only)*
❑ ERTH ~~300~~ 333 *(Fall only)*
❑ ERTH 305 *(Spring only)*
~~❑ ERTH 406~~
❑ ERTH 410 *(Fall only)*
❑ ATMO 101 / ❑ ATMO 101L
❑ ATMO 200
❑ OCN 201/ ❑ 201L
❑ OCN 310 *(Fall only)*
❑ ~~ITE~~ STE 401[1]
❑ EDEF 310[1]
❑ EDEP 311[1]
❑ STE 402N[1]
❑ STE 440[1]
~~Environmental Earth Science Upper Division~~ Science Electives (~~5~~ 12 credits)
❑
❑

University of Hawai‘i at Mānoa
School of Ocean and Earth Science and Technology Program Sheet 2023-2024
Bachelor of Arts (BA) in Environmental Earth Science
Track: Earth Science Education Proposed Program Sheet
Admissions: Open Process: Declaration
Min. Total Credits: 120 (~~90~~ 105 in core & major + ~~30~~ 15 in electives)

❑
❑
List of approved ~~upper division~~ science electives: any upper division ERTH, EPET, ATMO, or OCN course; GEO 370, 388, 405; NREM 301, 302, 477; ~~OCN 320, 331, 457;~~ PEPS 451; PLAN 414; POLS 380; TPSS 304. *[1]Students not pursuing the BAP in Earth Science Education/Post Baccalaureate Certificate in Teacher Education may replace these courses with additional Science Electives.*

Notes

School of Ocean and Earth Science and Technology: Student Academic Services, Director of Student Services: Heather Saito; HIG 131B; (808) 956-8763; hsaito2@hawaii.edu; https://www.soest.hawaii.edu/soestwp/education/undergraduate/advising/
Department of Earth Sciences; POST 701; (808) 956-7640; earth-dept@soest.hawaii.edu; www.soest.hawaii.edu/earthsciences

Current Plan Template:

University of Hawai'i at Mānoa – Four-Year Academic Plan 2022-2023

School of Ocean and Earth Science and Technology

Bachelor of Arts (BA) in Environmental Earth Science

This is a sample academic plan. Students should meet with an academic advisor prior to registration to formulate their own plan.

Year 1		Year 2		Year 3		Year 4	
Fall		**Fall**		**Fall**		**Fall**	
ERTH 101/103/ 104/106/130* (DP)	3	**Elective (ERTH 250)**	3	**ERTH 325**	3	**ERTH 410**	2
ERTH 101L* (DY)	1	**CHEM 162**	3	**ERTH Elective 300+ (ERTH 333)**	3	**ERTH 461**	3
MATH 241 or **215** (FQ)	4	**CHEM 162L**	1			**ERTH Elective 300+**	3
OEST 100	1	**BIOL 171/GES 102/BOT MICR 130/OEST 103/ ZOOL 101** (DB)	3	**PHYS 152**	3	Elective 300+	3
FW	3			**PHYS 152L**	1	Elective	3
FG (A/B/C)	3	DS	3	Elective 300+	3		
		DA/DH/DL	3	Elective	3		
Credits	15	Credits	16	Credits	16	Credits	14
Spring		**Spring**		**Spring**		**Spring**	
ERTH 200	4	**ERTH 309**	4	**ERTH Elective 300+**	3	**ERTH 305**	3
CHEM 161	3	**PHYS 151**	3	**ERTH Elective 300+**	3	**ERTH 455**	4
CHEM 161L	1	**PHYS 151L**	1	Elective 300+	3	**ERTH Elective 300+**	3
FG (A/B/C)	3	DS	3	Elective 300+	3	Elective	3
Elective	3	DA/DH/DL	3	Elective	3	Elective	3
Credits	14	Credits	14	Credits	15	Credits	16
Summer		**Summer**		**Summer**		**Summer**	
Total Credits	29	**Total Credits**	59	**Total Credits**	90	**Total Credits**	120

Notes:

Students must take placement exams to be able to register for CHEM 161 and MATH 241.

Students must incorporate all focus requirements into this plan. Focus designations (i.e., W, E, O, H) are CRN specific & semester specific.

Minimum 45 upper division (300+ course) credits are required.

The following may fulfill major courses: any undergraduate ERTH course; GEO 388; NREM 477; OCN 320, TPSS 304.

*ERTH 170 can fulfill DP/DY requirements.

Proposed Plan Template: General Track

University of Hawai'i at Mānoa – Four-Year Academic Plan 2022-2023

School of Ocean and Earth Science and Technology

Bachelor of Arts (BA) in Environmental Earth Science

General Track

This is a sample academic plan. Students should meet with an academic advisor prior to registration to formulate their own plan.

Year 1		Year 2		Year 3		Year 4	
Fall		**Fall**		**Fall**		**Fall**	
ERTH 101/103/ 104/106/130* (DP)	3	~~Elective (ERTH 250)~~ ERTH 201[4]	3	ERTH ~~325~~ 303	3	ERTH ~~410~~ 455	4
ERTH 101L* (DY)	1	CHEM 162	3	~~ERTH Elective 300+~~		ERTH 461[5]	3
MATH 241 or 215 (FQ)	4	CHEM 162L	1	TPSS 304	3	~~ERTH~~ Science Elective	3
OEST 100	1	OCN 102[3] ~~BIOL 171/GES 102/BOT~~	3	ERTH 410	2	Elective 300+	3
FW	3	~~MICR 130/OEST 103/~~		PHYS 152	3	Elective	3
OCN 105 (FG-A)[1]	3	~~ZOOL 101 (DB)~~		PHYS 152L	1		
		DS	3	~~Elective 300+~~			
		DA/~~DH~~/DL	3	~~Elective~~ ERTH 333	4		
Credits	15	Credits	16	Credits	16	Credits	16
Spring		**Spring**		**Spring**		**Spring**	
ERTH 200[2]	4	~~ERTH 309~~ Elective	3	~~ERTH~~ Science Elective	3	ERTH 305	3
CHEM 161	3	PHYS 151	3	ERTH 425	3	ERTH ~~455~~ 309	4
CHEM 161L	1	PHYS 151L	1	~~ERTH Elective 300+~~ DS	3	~~ERTH~~ Science Elective	3
ERTH 135 (FG-C)[1]	3	~~DS~~ Elective	4	Elective 300+	1	Elective 300+	3
Elective	3			~~Elective 300+~~			
~~Elective~~	~~2~~	~~DA/DH/DL~~ HWST 107 (DH)[4]	3	Elective	3	Elective	3
Credits	14	Credits	14	Credits	13	Credits	16
Summer		**Summer**		**Summer**		**Summer**	
Total Credits	29	**Total Credits**	59	**Total Credits**	88	**Total Credits**	120

Notes:

Students must take placement exams to be able to register for CHEM 161 and MATH 241.

Students must incorporate all focus requirements into this plan. Focus designations (i.e., W, E, O, H) are CRN specific & semester specific.

Minimum 45 upper division (300+ course) credits are required.

The following may fulfill Science~~upper division~~ elective requirements: any 300+ level ERTH, EPET, ATMO, or OCN course, plus GEO 370, 405; NREM 301, 302; PEPS 451; PLAN 414; POLS 380. Curated lists of electives for students interested in Coastal Geology, Geotechnical Training, or Geologic Hazards are listed in the course catalog or are available from your advisor.

~~The following may fulfill major courses: any undergraduate ERTH course; GEO 388; NREM 477; OCN 320, TPSS 304.~~

~~*ERTH 170 can fulfill DP/DY requirements.~~

[1] or other FG course

[2] Either ERTH 200 or 201 can satisfy this requirement (taking both is recommended). Whichever is not taken can be replaced by an elective.

[3] or other DB course from this list: BIOC 441; BE 120; BIOL 171, BOT 101; MICR 130; NREM 210, 251; OEST 103; ZOOL 101, 200.

[4] or other DH course

[5] or GEO 388 or NREM 477

Current Plan Template: Earth Science Education Track

University of Hawai'i at Mānoa – Five-Year Academic Plan 2022-2023

School of Ocean and Earth Science and Technology/College of Education

Bachelor of Arts (BA) in Environmental Earth Science

Earth Science Education/Post-Baccalaureate Certificate in Teacher Education (PBCTE)

This is a sample academic plan. Students should meet with an academic advisor prior to registration to formulate their own plan.

Year 1		Year 2		Year 3		Year 4		PBCTE Year 1	
Fall		Fall		Fall		Fall		Fall	
ERTH 101/103/104/	3	ATMO 101	3	BIOL 171 (DB)	3	*Submit PBCTE Application*		ITE 402H	3
106/130* (DP)		ATMO 101L	1	BIOL 171L	1	EDEP 311	3	ITE 404H	3
ERTH 101L (DY)	1	CHEM 161	3	ERTH 300**	3	OCN 310	3	SPED 445	3
MATH 241 or 215 (F	4	CHEM 161L	1	ATMO 200	3	ERTH 410	2		
OEST 100	1	PHYS 152	3	DA/DH/DL	3	ERTH Elective 300+	2		
FW	3	PHYS 152L	1	Elective	3	Elective 300+	3		
FG (A/B/C)	3	Elective	3			Elective 300+	2		
Credits	15	Credits	15	Credits	16	Credits	15	Credits	9
Spring		Spring		Spring		Spring		Spring	
ERTH 200	4	EDEF 310 (DS)	3	BIOL 172	3	ERTH 305	3	ITE 405H	9
ERTH 105 or	3	CHEM 162	3	BIOL 172L	1	ITE 401	3	ITE 406	3
ASTR 110		CHEM 162L	1	ERTH 406	3	ITE 402N	3		
PHYS 151	3	OCN 201	3	ERTH Elective	3	ITE 440	3		
PHYS 151L	1	OCN 201L	1	300+		Elective 300+	3		
FG (A/B/C)	3	DA/DH/DL	3	Elective 300+	3				
Elective	3					*BA degree projected*			
Credits	17	Credits	14	Credits	13	Credits	15	Credits	12
Summer		Summer		Summer		Summer		Summer	
Credits	0	Credits	0	Credits	0	Credits	0	Credits	0
Total Credits	32	Total Credits	61	Total Credits	90	Total Credits	120	Total Credits	141

Notes:

Students must take placement exams to register for CHEM 161 and MATH 241. Minimum 45 upper division (300+ course) credits are required.

Students must incorporate all focus requirements into this plan. Focus designations (i.e., W, E, O, H) are CRN specific & semester specific.

EDEF 310 and EDEP 311 taken in the EES program will be waived in PBCTE Secondary science program.

ITE 401, 402N, and 440 double-counts for both programs. Advising for EES will be conducted by SOEST; advising for PBCTE will be conducted by COE.

The following may fulfill ERTH elective courses: any upper division ERTH courses; GEO 405; NREM 477; OCN 320, 331, 457; or any upper division course from SOEST.

*ERTH 170 can fulfill DP/DY requirements. **ERTH 333 will replace 300 upon approval

Proposed Plan Template: Earth Science Education Track

University of Hawai'i at Mānoa – Five-Year Academic Plan 2022-2023

School of Ocean and Earth Science and Technology/College of Education

Bachelor of Arts (BA) in Environmental Earth Science

Earth Science Education/Post-Baccalaureate Certificate in Teacher Education (PBCTE)

This is a sample academic plan. Students should meet with an academic advisor prior to registration to formulate their own plan.

Year 1		Year 2		Year 3		Year 4		PBCTE Year 1	
Fall		**Fall**		**Fall**		**Fall** *Submit PBCTE Application*		**Fall**	
ERTH 101/103/104/	3	ATMO 101	3	BIOL 171 (DB)	3	EDEP 311 (DS)[2]	3	STE 402H	3
106/130* (DP)		ATMO 101L	1	BIOL 171L	1	OCN 310	3	STE 404H	3
ERTH 101L (DY)	1	CHEM 161	3	~~ERTH 300**~~ERTH 333	4	ERTH 410	2	SPED 445	3
MATH 241 or 215 (FQ)	4	CHEM 161L	1	ATMO 200	3	~~ERTH~~ Science Elective ~~300+~~	3		
OEST 100	1	PHYS 152	3	~~DA/DH/DL~~		Elective 300+	3		
FW	3	PHYS 152L	1	Science Elective	3	~~Elective 300+~~	~~3~~		
~~FG (A/B/C)~~OCN 105 (FGA)[1]	3	~~Elective~~ ERTH 201[2]	3						
Credits	15	Credits	15	Credits	14	Credits	14	Credits	9
Spring		**Spring**		**Spring**		**Spring**		**Spring**	
ERTH 200[2]	4	EDEF 310 (DS)[3]	3	BIOL 172	3	ERTH 305	3	STE 405H	9
ERTH 105 or	3	CHEM 162	3	BIOL 172L	1	STE 401[3]	3	STE 406	3
ASTR 110		CHEM 162L	1	~~ERTH 406~~	~~3~~	STE 402N[3]	3		
PHYS 151	3	OCN 201	3	Science Elective	3	STE 440[3]	3		
PHYS 151L	1	OCN 201L	1	~~ERTH~~ Science Elective ~~300+~~	3	~~Elective 300+~~	~~2~~		
~~FG (A/B/C)~~ ERTH 135 (FGC	3	DA/~~DH~~/DL	3	Elective 300+	3				
Elective	3	HWST 107 (DH)[4]	3	Elective	3	*BA degree projected*			
Credits	17	Credits	17	Credits	16	Credits	12	Credits	12
Summer		**Summer**		**Summer**		**Summer**		**Summer**	
Credits	0	Credits	0	Credits	0	Credits	0	Credits	0
Total Credits	32	**Total Credits**	64	**Total Credits**	94	**Total Credits**	120	**Total Credits**	141

Notes:

Students must take placement exams to register for CHEM 161 and MATH 241. Minimum 45 upper division (300+ course) credits are required.

Students must incorporate all focus requirements into this plan. Focus designations (i.e., W, E, O, H) are CRN specific & semester specific.

EDEF 310 and EDEP 311 taken in the EES program will be waived in PBCTE Secondary science program.

STE 401, 402N, and 440 double-count for both programs. Advising for EES will be conducted by SOEST; advising for PBCTE will be conducted by COE.

The following may fulfill Science Elective courses: any upper division ERTH, EPET, ATMO, or OCN course, plus GEO 370, 388, 405; NREM 301, ~~courses; GEO 405; NREM 477; OCN 320, 331, 457~~ 302, 477; PEPS 451; PLAN 414; POLS 380; TPSS 304 ~~from SOEST~~.

[1] or other FG course

[2] Either ERTH 200 or 201 can satisfy this requirement (taking both is recommended). Whichever is not taken should be replaced by an elective.

[3] Students not pursuing the BAP in Earth Science Education/Post Baccalaureate Certificate in Teacher Education may replace these courses with additional Earth 300+ electives. They will also need to ensure that two of their lower-division electives satisfy DS.

[4] or other DH course

~~*ERTH 170 can fulfill DP/DY requirements. **ERTH 300 may be replaced with ERTH 333 pending approval.~~

Current Course Catalog description

BA in Environmental Earth Science

Requirements

The BA degree in environmental earth science is appropriate for students interested in Earth Science but not necessarily intending to pursue graduate school. It is more flexible than the BS program. The BA degree requires completion of 120 credit hours of course work, the equivalent of four years of full-time study. A minimum grade of C (not C-) must be achieved in each class in the major and in all support classes.

The Environmental Earth Science BA is geared toward students who plan to enter the environmental and geotechnical fields upon graduation. It includes a combination of traditional geology topics such as field methods and sedimentology, as well as more applied topics such as hydrogeology, geospatial information, and environmental geochemistry.

The BA requires 27 credits in the earth sciences curriculum. This includes one introductory level ERTH course with a lab, six non-introductory ERTH courses, a two-credit seminar, and at least 15 additional credits of approved electives in ERTH or other departments. With the advice and consent of an undergraduate advisor, courses in other natural sciences, mathematics, or engineering may be substituted as electives. Required support classes include physics, chemistry, biological sciences, and one semester of college calculus; these total 24-25 credits and should be taken as early as possible

Earth Science and Other Courses

- Required Courses (27 credits)
    - ERTH 101 Dynamic Earth (3), or 103 Geology of the Hawaiian Islands (3), or 104 Volcanoes in the Sea (3), or 106 Humans and the Environment (3), or E130 Geologic Hazards, or 170 Physical Geology (4)
    - ERTH 101L Dynamic Earth Laboratory (1) (unless ERTH 170 is taken)
    - ERTH 200 Geological Inquiry (4)
    - ERTH 305 Geological Field Methods (3)
    - ERTH 309 Sedimentology and Stratigraphy (4)
    - ERTH 325 Geochemistry (3), or 425 Environmental Geochemistry (3)
    - ERTH 410 Undergraduate Seminar (2)
    - ERTH 455 Hydrogeology (4)
    - ERTH 461 Geospatial Information (3)

- Upper Division Science Electives (15 credits)
    - All Upper Division ERTH courses will satisfy elective degree requirements for all degrees. For all bachelors degrees the following electives from outside ERTH are pre-approved: GEO 388, NREM 477, OCN 320, TPSS 304
- Required Support Courses (24 credits)
    - General Chemistry (CHEM 161, 161L, 162, 162L)
    - Calculus I (MATH 215 or 241)
    - College Physics (PHYS 151, 151L, 152, 152L)
    - Biological Sciences (BIOL 171, BOT 101, MICR 130, OEST 103, ZOOL 101, OCN 102, or GES 102)
- The College Experience (OEST 100)

For information on a Bachelor Degree Program Sheet, go to programsheets/.

BA in Environmental Earth Science, Earth Science Education Track

The Earth Science Education track is for students who want to become excellent middle school and high school Science teachers. The curriculum includes required topical course work for Earth Sciences certification by the Hawai'i State Department of Education, including courses in earth sciences, meteorology, oceanography, astronomy, biology, chemistry, and physics. If students in the Earth Science Education track enroll in the College of Education's Post-Baccalaureate certificate program after they earn the BA, they will be certified as Earth Science teachers in Hawai'i.

This BA track requires 41 credits in the earth sciences, oceanography, and atmospheric sciences curriculum, including introductory level ERTH and ATMO courses with labs, eight non-introductory ERTH, ATMO, and OCN courses, a two-credit seminar, an upper-division teacher education course, and at least 5 credits of approved upper division electives. With the advice and consent of an undergraduate advisor, courses in other natural sciences, mathematics, or engineering may be substituted as electives. Students are strongly encouraged to take a mainland summer field course as an elective. Required support classes include physics, chemistry, biological sciences, and one semester of college calculus; these total 28 credits and should be taken as early as possible.

Earth Sciences and Other Courses

- Required Courses (39 credits)
    - ERTH 101 Dynamic Earth (3), or 103 Geology of the Hawaiian Islands (3), or 104 Volcanoes in the Sea (3), or 106 Humans and the Environment (3), or 130 Geologic Hazards, or 170 Physical Geology (4)
    - ERTH 101L Dynamic Earth Laboratory (1) (unless ERTH 170 is taken)
    - ATMO 101/101L Introduction to Meteorology/Lab (4)

- ERTH 105 Voyage through the Solar System (3) or ASTR 110 Survey of Astronomy (3)
- ERTH 200 Geological Inquiry (4)
- ATMO 200 Atmospheric Processes and Phenomena (3)
- OCN 201/201L Science of the Sea (4)
- ERTH 300 Volcanology (3)
- ERTH 305 Geological Field Methods (3)
- OCN 310 Global Environmental Change (3)
- ERTH 406 Natural Disasters (3)
- ITE 401 Engaging the Adolescent Learner (3)
- ERTH 410 Undergraduate Seminar (2)

- Upper Division Science Electives (5 credits)
  - See listing under the BA in Environmental Earth Sciences. GEO 405, OCN 331, and OCN 457 are also preapproved electives for this degree.
- Required Support Courses (25 credits)
  - General Chemistry (CHEM 161/161L, 162/162L)
  - Calculus I (MATH 215 or 241)
  - College Physics (PHYS 151/151L, 152/152L)
  - Biological Sciences (BIOL 171/171L)
  - OEST 100

For information on a Bachelor Degree Program Sheet, go to programsheets/.

Proposed Course Catalog description

BA in Environmental Earth Science, General Track

Requirements

The General track of the BA degree in environmental earth science is appropriate for students interested in Earth Science but not necessarily intending to pursue graduate school. It is more flexible than the BS program. The BA degree requires completion of 120 credit hours of course work, the equivalent of four years of full-time study. A minimum grade of C (not C-) must be achieved in each class in the major and in all support classes.

This BA degree~~The Environmental Earth Science BA~~ is geared toward students who plan to enter the environmental and geotechnical fields upon graduation. It includes a combination of traditional geology topics such as field methods and sedimentology, as well as more applied topics such as hydrogeology, geospatial information, and environmental geochemistry. Students interested in Coastal Geology, Geologic Hazards, or Geotechnical Training can opt for a curated set of electives that will provide focused content on these topics.

The General track of the BA requires ~~27~~ 45-47 credits in the earth sciences curriculum. This includes one introductory level ERTH course with a lab, ~~six~~ nine non-introductory ERTH courses, TPSS 304, and a two-credit seminar, and at least ~~15~~ 9 additional credits of approved electives in ERTH or other departments. With the advice and consent of an undergraduate advisor, courses in other natural sciences, mathematics, or engineering may be substituted as electives. Required support classes include physics, chemistry, biological sciences, and one semester of college calculus; these total 24-25 credits and should be taken as early as possible.

Earth Science and Other Courses

- Required Courses (~~27~~ 36-38 credits)
    - ERTH 101 Dynamic Earth (3), or 103 Geology of the Hawaiian Islands (3), or 104 Volcanoes in the Sea (3), or 106 Humans and the Environment (3), or ~~E~~130 Geologic Hazards~~, or 170 Physical Geology (4)~~
    - ERTH 101L Dynamic Earth Laboratory (1)~~ (unless ERTH 170 is taken)~~
    - ERTH 200 Geological Inquiry (4) or ERTH 201 Climate Change (3)
    - ERTH 303 Natural Hazards and Geomechanics (3)
    - ERTH 305 Geological Field Methods (3)
    - ERTH 309 Sedimentology and Stratigraphy (4)
    - ERTH 333 Earth Materials and Structures (4)
    - ERTH ~~325 Geochemistry (3), or~~ 425 Environmental Geochemistry (3)

- ERTH 410 Undergraduate Seminar (2)
- ERTH 455 Hydrogeology (4)
- ERTH 461 Geospatial Information (3) or GEO 388 (3) or NREM 477 (4)
- TPSS 304 Introduction to Soil Science (3)

- ~~Upper Division~~ Science Electives (~~15~~ 9 credits)
  - ~~o~~ All Upper Division ERTH, EPET, ATMO, or OCN courses plus GEO 370, 405; NREM 301, 302; PEPS 451; PLAN 414; POLS 380 will satisfy elective degree requirements ~~for all degrees. For all bachelors degrees the following electives from outside ERTH are pre-approved: GEO 388, NREM 477, OCN 320, TPSS 304~~
  - Curated lists of electives are as follows:
    - Coastal Geology: OCN 201 + Lab (note, not upper-division), OCN 320; ERTH 420; and GEO 370, NREM 301
    - Geotechnical Training: ERTH 306; GEO 412; NREM 301, PEPS 451
    - Geologic Hazards: ERTH 300, 402; GEO 370; PLAN 414
- Required Support Courses (24 credits)
  - General Chemistry (CHEM 161, 161L, 162, 162L)
  - Calculus I (MATH 215 or 241)
  - College Physics (PHYS 151, 151L, 152, 152L)
  - Biological Sciences (BE 120, BIOC 441, BIOL 171, BOT 101, MICR 130, NREM 210, 251, OEST 103, ZOOL 101, 200, OCN 102~~, or GES 102~~)
- The College Experience (OEST 100)

For information on a Bachelor Degree Program Sheet, go to programsheets/.

BA in Environmental Earth Science, Earth Science Education Track

The Earth Science Education track is for students who want to become excellent middle school and high school Earth Science teachers. This track is part of a 5-year BAP (Bachelors and Post Baccalaureate) degree program whereby students in their 3rd year are admitted to the College of Education's Post-Baccalaureate Certificate in Teacher Education (PBCTE) program. Upon completion of the 4th year of the BA and then the 1-year Post-Baccalaureate program, students will be certified as teachers for ~~The curriculum includes required topical course work for Earth Sciences certification by~~ the Hawai'i State Department of Education. Science coursework covers~~, including courses in~~ earth sciences, meteorology, oceanography, astronomy, biology, chemistry, and physics. ~~If students in the Earth Science Education track enroll in the College of Education's Post-Baccalaureate certificate program after they earn the BA, they will be certified as Earth Science teachers in Hawai'i.~~

This BA track requires ~~41~~ 33 or 34 credits in the earth sciences, oceanography, and atmospheric sciences curriculum, including introductory level ERTH and ATMO courses with labs, ~~eight~~ non-introductory ERTH, ATMO, and OCN courses, a two-credit seminar, ~~an upper-division teacher education course,~~ and at least ~~5~~ 12 credits of approved upper division science electives. The track also includes 15 credits of Education courses that cover methods of learning, teaching practicum, and education psychology. If a student decides to opt out of the PBCTE program, s/he can replace the Education courses with upper-division science electives, and earn only the Environmental Earth Sciences - Earth Science Education BA degree. ~~With the advice and consent of an undergraduate advisor, courses in other natural sciences, mathematics, or engineering may be substituted as electives. Students are strongly encouraged to take a mainland summer field course as an elective.~~ Required support classes include physics, chemistry, biology ~~biological sciences~~, and one semester of college calculus; these total ~~28~~ 29 credits and should be taken as early as possible.

Earth Sciences and Other Courses

- Required Courses (~~39~~ 49 or 48 credits)
    - ERTH 101 Dynamic Earth (3), or 103 Geology of the Hawaiian Islands (3), or 104 Volcanoes in the Sea (3), or 106 Humans and the Environment (3), or 130 Geologic Hazards~~, or 170 Physical Geology (4)~~
    - ~~o~~ ERTH 101L Dynamic Earth Laboratory (1) ~~(unless ERTH 170 is taken)~~
    - ATMO 101/101L Introduction to Meteorology/Lab (4)
    - ERTH 105 Voyage through the Solar System (3) or ASTR 110 Survey of Astronomy (3)
    - ERTH 200 Geological Inquiry (4) or ERTH 201 Climate Change (3)
    - ATMO 200 Atmospheric Processes and Phenomena (3)
    - OCN 201, 201L Science of the Sea (4)
    - ERTH ~~300 Volcanology (3)~~ 333 Earth Materials and Structures (4)
    - ERTH 305 Geological Field Methods (3)
    - OCN 310 Global Environmental Change (3)
    - EDEF 310 Education in American Society (3)

- EDEP 311 Introduction to Educational Psychology (3)
- ~~ERTH 406 Natural Disasters (3)~~
- ~~ITE~~ STE 401 ~~Engaging the Adolescent Learner~~ Principles & Methods of Literacies Within and Across the Disciplines (6-12) (3)
- STE 402N Teaching Practicum (3)
- ERTH 410 Undergraduate Seminar (2)
- STE 440 Multicultural and Social Justice Education (3)

- ~~Upper Division~~ Science Electives (~~5~~ 12 credits)
  - ~~See listing under the BA in Environmental Earth Sciences. GEO 405, OCN 331, and OCN 457 are also preapproved electives for this degree~~ All upper division ERTH, EPET, ATMO, or OCN course, plus GEO 370, 388, 405; NREM 301, 302, 477; PEPS 451; PLAN 414; POLS 380; TPSS 304.
- Required Support Courses (~~25~~ 29 credits)
  - General Chemistry (CHEM 161, 161L, 162, 162L)
  - Calculus I (MATH 215 or 241)
  - College Physics (PHYS 151, 151L, 152, 152L)
  - ~~Biological Sciences~~ Introduction to Biology I (BIOL 171, 171L)
  - Introduction to Biology II (BIOL 172, 172L)
  - The College Experience (OEST 100)

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