Upper-division economics elective	3	3
Electives & General Education	10	8
	15	15

Requirements for a Minor

To earn a minor in economics the student must complete ECNS 201S, 202S, 301, 302 (ECON 111S, 112S, 311, 313), and six additional credits of economics classes numbered 300 or above, only three of which may be in ECNS 486 (ECON 486).

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Economics (ECNS) - Course Descriptions

101S, 191, 201S, 202S, 217X, 301, 302, 310, 312, 313, 315, 320, 374, 391, 392, 398, 403, 405, 406,433, 445, 450, 486, 488, 491, 492, 494, 499, 501, 511, 513, 560, 569, 595, 596, 598, 599

Faculty

Professors

Douglas Dalenberg, Ph.D., University of Oregon, 1987

Associate Professor

Jeffrey T. Bookwalter, Ph.D., University of Utah, 1999

Derek K. Kellenberg, Chairperson, Ph.D., University of Colorado, 2004

Assistant Professors

Amanda Dawsey, Ph.D., University of Maryland at College Park, 2001

Katrina Mullan, Ph.D., University of Cambridge, 2009

Helen Naughton, Ph.D., University of Oregon, 2007

Ranjan Shrestha, Ph.D., Ohio State University, 2007

Matthew P. Taylor, Ph.D., University of Oregon, 2012

Research Professors

Richard D. Erb, Ph.D., Stanford University, 1967

Thomas M. Power, Ph.D., (Professor Emeritus) Princeton, 1971

Emeritus Professors

Richard N. Barrett, Ph.D., University of Wisconsin, Madison, 1972

Ronald A. Dulaney, Ph.D., Columbia University, 1973

Dennis J. O'Donnell, Ph.D., Pennsylvania State University, 1974

John G. Photiades, Ph.D., University of Illinois, 1972

Kay Unger, Ph.D., Johns Hopkins University, 1974

Department of English

- Special Degree Requirements
- Sample Course of Study
- Courses
- Faculty

John Hunt, Chair

The Department of English is among the oldest and most prestigious units at the University. As one of the campus's original departments, it offered some of the university's inaugural courses, including literature classes taught by UM's first president, Oscar J. Craig. In 1919, Rhodes Scholar H.G. Merriam inaugurated one of the first creative writing programs in the country. Now, more than a century old, this department–which has employed writers and scholars such as Richard Hugo, Leslie Fiedler, William Kittredge and Patricia Goedicke–offers a B.A. with options in multiple disciplines and graduate degrees in creative writing (M.F.A.), literature (M.A.), and teaching (M.A.). Its Composition program serves the entire university by offering the first year composition requirement, as well as courses in advanced composition and graduate seminars in the teaching of writing.

The department offers six options for English majors: 1) Literature; 2) Creative Writing; 3) English Teaching; 4) Film studies; 5) Teaching English as a Second Language; and 6) Linguistics. In addition, students may pursue a general minor in English or minors in Film Studies, English Teaching and Irish Studies.

Under the Literature option, students ground their study in the reading and examination of works through a series of historically based surveys as well as other core courses, covering the techniques of literary analysis, the application of literary theory, and finally the development of a research project in a senior capstone. Students complement these core courses with a selection of electives that engage specific genres, authors, and periods, as well as different disciplines (e.g. Literature and the Environment) and literatures of diversity (e.g. Native American Literature). M.A. students select graduate seminars in American, British, and comparative literatures as well as other disciplines, their course work culminating in a research thesis or a portfolio of seminar papers revised in collaboration with a committee. The literature emphasis imparts an understanding of not only the aesthetic richness of canonical and emerging literatures but also the historical and cultural forces that have contributed to their making. The classes are of a size that makes discussion very much a part of a student’s experience.

The Creative Writing program is predicated on the model of the workshop, and focuses on three areas of study: poetry, fiction, and nonfiction. Undergraduates who select the creative writing option fulfill some of the same requirements as those in literature, while also participating in a series of small writing workshops, gaining the techniques needed to craft poetry and/or prose that work towards artistic excellence. Graduate students pursuing an M.F.A. degree complete a series of writing workshops and seminars designed to develop their creative work and expand their understanding of literary technique. The Creative Writing faculty is augmented each year by visiting Hugo and Kittredge fellows. The program sponsors the graduate literary magazine *CutBank*, now in its fourth decade of publishing works of poetry, fiction and art. Additionally, undergraduate students have the opportunity to contribute to and edit their own literary magazine, *The Oval*.

The English Teaching program provides content knowledge, pedagogy, and professional experiences required for teaching literacy in a democratic society. Based on current research and best practices, the English Teaching program integrates the study of language, literature, and media, creating learning communities and supporting teachers as critical thinkers, creative problem solvers, and reflective practitioners. Students who successfully complete this option and the requirements from the College of Education receive both a B.A. in English teaching and a secondary teaching license (grades 5-12) in English. At the graduate level, the English Teaching program offers advanced theory and pedagogy courses, culminating in an M.A. in teaching. The English Teaching Program is also the home of the Montana Writing Project, which is dedicated to improving the teaching and learning of writing at all grade levels and offers a special focus on meeting the state-mandated Indian Education for All.

In Film Studies, students receive a thorough introduction to the many facets of moving image culture, including a background in film history, theory, and aesthetics. In this interdisciplinary program, students are exposed to a broad array of national and international films, as well as filmic translations of well-known works of literature. Students analyze film from a variety of theoretical perspectives and become critical viewers of what is now one of the most predominant forms of cultural

representation. Film Studies currently offers a minor for those students who wish to learn more in this discipline without committing fully to the degree program.

In conjunction with the Linguistics Program, English also offers two options in English Linguistics: 1) General Linguistics, which provides a background in both literature and linguistics, and 2) Teaching English as a Second Language, which prepares students for the particular concerns of second-language acquisition and pedagogy while also providing a foundation in the study of literature. Please note that the Teaching English as a Second Language (ESL) major option is not a stand-alone route to licensure. For licensure requirements, refer to the College of Education section in this catalog.

The Department of English also offers an interdisciplinary minor in Irish Studies which provides students access to instruction in Irish language, history, literature, and culture. This academic and artistic approach to Irish culture involves an interdisciplinary and inter-collegiate collaboration that brings together leading scholars in the humanities and the creative arts.

Through the administration of one of the core competency requirements of the University's General Education curriculum, the Composition program serves the entire student body by ensuring that all students learn to write with clarity of thought and precision of language. Writing is understood as a skill, one that is improved by instructing students in the concerns of audience, organization, development, voice, diction, and grammar. Good writing also is related to cogent thinking, and the Composition program–through both its general education requirement and its advanced courses–seeks to integrate critical thinking within the production of skilled writing.

Admission Requirements

To be admitted to any option of the English major, a student must satisfy the following requirements:

1. Completion of 24 credits overall with a minimum cumulative GPA of 2.5 or a GPA of 2.5 in the previous two terms.
2. Completion of at least nine credits in English, excluding WRIT (composition) courses, with a minimum GPA of 2.5 and no grade lower than a C (2.00) in those courses.

Students who intend to major in English but who have not yet met the above requirements are admitted to the program as pre-English majors. Pre-English majors will be assigned to the English department Academic Advisor. Before a student can graduate with a major in English, she/he must meet the requirements to become an English major and declare a specific option within the program.

Special Degree Requirements

For University graduation requirements, please consult Academic Policy and Procedures: Degree/Certification Requirement for Graduation in this catalog.

For the Bachelor of Arts degree every major in English will complete the following requirements unless otherwise noted within the option:

1. At least 42 credits in English. Only courses under English, cross-listed with English, or labeled, in some cases, Linguistics will count toward the 42-60 credit major requirements. WRIT 101 (WTS 101, ENEX 101) does not count toward the major or minor.

   Majors in English may not take any course required for the English major on a credit/no credit basis.

2. Transfer students must complete a minimum of 9 credits of advisor-approved upper-division English courses at The University of Montana to receive a B.A. with a major in English. Within the Creative Writing option, a transfer student may petition for upper-division workshop credit. Petitions will be considered on a case-by-case basis.

Major Options

English majors must take all of the courses required in one of the following options within the English major:

- **Literature:** 1) LIT 201 (ENLT 201); 2) either LIT 220L or LIT 221L (ENLT 217 or ENLT 218); 3) two of the following courses: LIT 222L, 210L, 211L, (ENLT 219, 224, 225; 4) LIT 300 (ENLT 301); 5) LIT 327 (ENLT 320); 6) LIT 494 (ENLT

401); 7) seven upper-division electives (21 credits), including one from each of the following four areas: a) Medieval through Early-Modern British literature, b) Enlightenment through Romantic British literature or pre-1665 American literature, c) Theory, d) Diversity (categories a and b may be fulfilled at the 200-level if additional substitutions are made at the 300-level so the 42 credit minimum is met; 8) two years of one modern or classical language.

- **Creative Writing:** 1) CRWR 210A, 211A, or 212A (ENCR 210A, 211A, or 212A); 2) one of the following courses: LIT 110L, 120L, 201 (ENLT 120, 121, 201); 3) three of the following courses: LIT 220L, 221L, 222L, 210L, 211L (ENLT 217, 218, 219, 224, 225); 4) LIT 300 (ENLT 301); 5) LIT 327 (ENLT 320); 6) three additional 300 or 400 level LIT (ENLT), FILM (ENFM) or ENIR courses; 7) three upper-division creative writing workshops; 8) two years of one modern or classical language. Entry into 300- and 400-level Creative Writing workshops are by consent of instructor only. Creative Writing majors must submit samples of their work to the instructors of CRWR 410, 411, and 412 by the deadline in order to be considered for the next semester's workshops. Submission guidelines are posted in the English Department in LA 133 and on the Department and Creative Writing websites.
- **English Teaching:** For an endorsement in the extended major field of English: 1) either LIT 220L or 221 (ENLT 217 or 218); 2) two of the following courses: LIT 222L, 210L, 211L (ENLT 219, 224, 225); 3) one course chosen from LIT 120L, 201 (ENLT 121, 201) or CRWR 211A (ENCR 211A); 4) LIT 300 (ENLT 301); 5) LIT 327 (ENLT 320); 6) two additional 300-level LIT courses, one of which concentrates in American literature, the other of which has a diversity focus; 7) the following English Teaching courses: ENLI 465; ENT 439, 440, 441, 442; 8) two elective courses from ENLI, CRWR (ENCR), FILM (ENFM), WRIT (above 100-level), or ENIR (above 200-level); 9) secondary school teaching licensure courses (see the College of Education). This program requires a minimum of 45 credits within the English option and 128 total credits. Students in the English Teaching option must gain admission to the College of Education, apply and be accepted to student teach and meet the requirements for licensure as a secondary teacher (see the College of Education section of this catalog for more details).
- **Film Studies:** 1) FILM (ENFM/LS 180); 2) LIT 270L (ENLT 227L); 3) FILM 300 (ENFM 330); 4) LIT 300 (ENLT 301); 5) FILM 320 (ENFM 320); 6) FILM 447 (ENFM 427); 7) two years of one modern or classical language; 8) Nine courses (27 credits) from the following electives: MAR 101L, FILM 262 (ENFM 222), FILM 363 (ENFM 338), FLIM 365 (ENFM 358), SPNS 359 (SPAN 359), LIT 376/LS 356, FILM 381 (ENFM 381), FILM 448 (ENFM 443), FILM 484 (ENFM 444), PHL 427 (PHIL 444), NASX 360, ENT 442, FILM 191 (ENFM 195), FILM 291 (ENFM 295), FILM 391 (ENFM 395), FILM 491 (ENFM 495), FILM 392 (ENFM 396/496), FILM 308 (ENFM 308), FILM 327 (ENFM 327), FILM 381 (ENFM 381), FILM 481 (ENFM 481), PHL 102 (PHIL 105).
- **English Linguistics:** General Linguistics: 1) LIT 220L (ENLT 217); 2) two of the following courses: LIT 221L, 222L, 210L, 211L (ENLT 218, 219, 224, 225); 3) LIT 327 (ENLT 320); 4) either LIT 349L or 350L (ENLT 349 or 350); 5) ENLI 465; 6) LING 470, 471, 472, 473, 474, and 476; 7) LING 489; 8) either LING 477 or 478; 9) either LING 475 or 478; and 10) two years of one modern or classical language. Linguistics requires a minimum of 45 credits within English/Linguistics.
- **Teaching English as a Second Language:** 1) LIT 220L (ENLT 217); 2) two courses from LIT 221L, 222L, 210L, 211L (ENLT 218,219,224,225); 3) ENT 440, and ENT 442; 4) ENLI 465; 5) LING 466, 470, 471, 472; 6) one course from LING 473,475,476; 7) either LING 477 or 478; 8) LING 480, 481, 491; 9) one upper division LING elective; and 10) two years of the same, spoken modern or classical language. Teaching ESL requires a minimum of 46 credits within English/ Linguistics. Students in the English Teaching option must gain admission to the College of Education, apply and be accepted to student teach and meet the requirements for licensure as a secondary teacher (see the College of Education section of this catalog for more details). Please note that the Teaching ESL major option is not a stand-alone route to licensure.

Minor requirements

General Minor in English

A minor in English requires at least nine courses (27 credits) in English excluding WRIT 101 (ENEX 101), which must include 1) four courses chosen from LIT 110L, 120L, 201, 220L, 221L, 222L, 210L, 211L (ENLT 120, 121, 201, 217, 218, 219, 224, 225); 2) LIT 300 (ENLT 301); 3) LIT 327 (ENLT 320). Remaining credits must be LIT (ENLT), FILM (ENFM), CRWR (ENCR), ENLI or ENIR courses numbered 300 or higher.

Minor Teaching Field of English

For an endorsement or minor in the minor teaching field of English, a student must complete 1) either LIT 220L or 221L (ENLT 217 or 218); 2) two of the following courses: LIT 222L, 210L, or 211L (ENLT 219, ENLT 224, or ENLT 225); 3) LIT 300 (ENLT 301); 4) LIT 327 (ENLT 320); 5) two additional 300 or 400 level LIT courses, one of which concentrates in American literature, one with a diversity focus; 6) the following English Teaching courses: LING 465 (ENLI 465); ENT 439; ENT 440; ENT 441; ENT 442; and 7) secondary school teaching licensure courses. Students in the minor English Teaching option must gain admission to Teacher Education program, apply and be accepted to student teach, and meet the requirements for licensure as a secondary teacher. (See the College of Education section of this catalog). Students must complete a teaching major in another discipline in order to teach 5-12th grade in Montana. The English Teaching minor is not a stand-alone route to licensure.

Minor in Irish Studies

For a minor in the field of Irish Studies, a student must complete at least six courses (18 credits), including four required core courses, and two elective courses. A student must complete 1) ENIR/IRSH 101; 2) ENIR/IRSH 102; 3) HSTR250 (HIST 249)/ENIR 249; and 4) One of the following: ENIR 360, Irish and/or Northern Irish Literature (in English), LIT 391/ENIR 395 (ENLT/ENIR 395) Special Topics in Irish Literature and Culture, ENIR 380 Literature of Pre-Norman Ireland, or ENIR 345 Intro to Irish Gaelic Literature. A student wishing to take the Irish Studies Minor must contact the Director of Irish Studies and complete the requisite paperwork.

Minor in Film Studies

A minor in film studies requires at least 27 credits including 4 required courses and at least 5 elective courses. Requirements: 1) FILM 103 (ENFM 180); 2) LIT 270; 3) FILM 300 (ENFM 330); 4) FILM 447 (ENFM 427). For remaining credits, students must choose at least five of the following electives. Two of these courses must be 300 level or above. Selections include the following: MAR 101L, FILM 262 (ENFM 222), FILM 363 (ENFM 338), FILM 365 (ENFM 358), SPNS 359 (SPAN 359), LIT 376/LS 356, FILM 381 (ENFM 381), FILM 448 (ENFM 443), FILM 484 (ENFM 444), PHL 427 (PHIL 444), NASX 360, ENT 442, FILM 191 (ENFM 195), FILM 291 (ENFM 295), FILM 391 (ENFM 395), FILM 491 (ENFM 495), FILM 492 (ENFM 396/496), FILM 308 (ENFM 308), FILM 327 (ENFM 327), FILM 381 (ENFM 381), FILM 481 (ENFM 481), PHL 102 (PHIL 105), PHIL 340L (PHL 327).

Sample Courses of Study

Literature

First Year	A	S
WRIT 101 (ENEX 101) Composition (Last name A-L in autumn; M-Z in spring)	3	(3)
LIT 201 (ENLT 201L) Intro to Literary Studies	3	-
LIT 220L or 221L (ENLST 217L, 218L) Brit Lit: Medieval to Renaissance, Brit Lit: Enlightenment to Romantic	-	3
Modern or Classical language	5	5
Electives or General Education	4	7
	15	15
Second Year	**A**	**S**
LIT 222L, 210L, 211L (ENLT, 219:, 224:, 225L) Brit Lit Victorian to Contemp, American Lit I or American Lit II	3	-
LIT 222L, 210L, 211L (ENLT 219L, 224L, 225L) Brit Lit Victorian to Contemp, American Lit I or American Lit II	3	-
LIT 300 (ENLT 301) Literary Criticism	-	3
Modern or Classical language	4	4
Electives or General Education	5	8
	15	15
Third Year	**A**	**S**
LIT 327 (ENLT 320) Shakespeare	3	-
English Electives and General Education	12	15
	15	15
Fourth Year	**A**	**S**
LIT 494 (ENLT 401) Capstone Seminar	-	3
English Electives and General Education	15	12
	15	15

Creative Writing Option

First Year	A	S
WRIT 101 (ENEX 101) Composition (Last name A-L in autumn; M-Z in spring)	3	(3)

CRWR 210A, 211A, or 212A (ENCR 210A, 211A or 212A) Introduction Workshops	(3)	3
LIT 110L, 201, or 120L	3	-
LIT 200-Level British Literature course: LIT 220L, 221L, 222L (ENLT 217, 218, 219)	-	3
Modern or Classical language	5	5
Electives or General Education	4	4
	15	15

Second Year	**A**	**S**
LIT 222L, 210L, 211L (ENLT, 219:, 224:, 225L) Brit Lit Victorian to Contemp, American Lit I or American Lit II	3	-
LIT 222L, 210L, 211L (ENLT 219L, 224L, 225L) Brit Lit Victorian to Contemp, American Lit I or American Lit II	3	-
LIT 300 (ENLT 301) Literary Criticism	-	3
Modern or Classical language	4	4
Electives (another CRWR 210A, 211A, or 212A Introduction Workshop recommended) or General Education	5	8
	15	15

Third Year	**A**	**S**
CRWR 310 or 311 or 312A (ENCR 310 or 311 or 312A) Intermediate Workshops	(3)	(3)
LIT 327 (ENLT 320) Shakespeare	3	-
LIT/FILM (ENFM)/ENIR 300- or 400-level course	3	3
Electives and General Education	9	9
	15	15

Fourth Year	**A**	**S**
CRWR 310 or 311 or 312A (ENCR 310 or 311 or 312A) Intermediate Workshops	3	-
CRWR 410, 411, or 412 (ENCR 410, 411, or 412) Advanced Workshops	-	3
LIT/FILM (ENFM)/ENIR 300- or 400-level course	3	-
Electives and General Education	9	12
	15	15

English Teaching Option

First Year	**A**	**S**
WRIT 101 (ENEX 101) Composition (Last name A-L in autumn; M-Z in spring)	3	(3)
One of LIT 120L, 201 (ENLT 121L, 201) or CRWR 211A (ENCR 211A) Intro Poetry Workshop	3	-
LIT 220L or 221L (ENLT 217L or 218L) British Literature	3	-
LIT 210L or 211L (ENLT 224L or 225) American Literature	-	3
General Education and pre-licensure requirements (refer to College of Education)	9	9
	15	15

Second Year	**A**	**S**
LIT 222L, 210L, 211L (ENLT 219L, 224L, 225L) Brit Lit Victorian to Contemp, American Lit I or American Lit II	3	-
LIT 300 (ENLT 301) Applied Literary Criticism	3	-
LIT 327 (ENLT 320) Shakespeare	-	3
English elective (LIT/FILM/CRWR/ENIR/LING/WRIT (above 100-level for WRIT)	-	3
General Education and pre-licensure requirements (refer to College of Education)	9	9
	15	15

Third Year	**A**	**S**
One 300 or 400-level LIT course concentrating in American literature	3	-
One 300 or 400-level LIT course with diversity focus	3	-
ENT 439 Studies in Young Adult Literature	3	-
ENLI 465 Structure and History of English for Teachers	-	3
ENT 440 Teaching Writing	-	3
English elective: LIT/FILM/CRWR/ENIR/LING/WRIT (above 100-level for WRIT)	-	3
General Education and licensure requirements	9	8
	18	17

Fourth Year	**A**	**S**
ENT 441 Teaching Reading and Literature	3	-
ENT 442 Teaching Oral Language & Media Literacy	3	-
General Education and licensure requirements	12	-
Certification requirement of EDU 495 (C&I 489) Student Teaching: Secondary	-	14
Certification requirement of EDU 494 (C&I 494) Professional Portfolio	-	1
	18	15

Film Option

First Year	**A**	**S**
WRIT 101 (ENEX 101) Composition (Last name A-L in autumn; M-Z in spring)	3	(3)
FILM 103 (ENFM 180) Introduction to Film	3	-
LIT 270L (ENLT 227L) Film as Literature, Literature as Film	-	3
Modern or Classical language	5	5
Electives/General Education	4 (7)	4

	15	15
Second Year	**A**	**S**
FILM 300 (ENFM 330) History of Film	3	-
FILM elective	3	3
Modern or Classical language	4	4
Electives/General Education	5	8
	15	15
Third Year	**A**	**S**
One 300- or 400-level FILM elective	3	-
LIT 300 (ENLT 301) Applied Literary Criticism	3	-
FILM 320 (ENFM 320) Shakespeare and Film	-	3
FILM electives/General Education	9	9
LIT 376 (ENLT 325) Studies in Literature and Film	-	3
	15	15
Fourth Year	**A**	**S**
FILM 447 (ENFM 427) Film Theory	-	3
Selections from Approved Film Offerings (upper-division FILM courses)	6	3
Electives/General Education	9	9
	15	15

Linguistics Option (General Linguistics)

First Year	**A**	**S**
WRIT 101 (ENEX 101) Composition (Last name A-L in autumn; M-Z in spring)	3	(3)
LIT 220 (ENLT 217L) British Literature	3	-
LIT 221L, 222L, 210L, 211L (ENLT 218L, 219L, 224L or 225L) (British or American Literature)	-	3
Modern or Classical language	5	5
General Education	4(7)	7
	15	15
Second Year	**A**	**S**
LIT 221L, 222L, 210L, 211L (ENLT 218L, 219L, 224L or 225L) (British or American Literature)	3	-
LIT 327 (ENLT 320) Shakespeare	-	3
LING 470 Introduction to Linguistic Analysis	-	3
Modern or Classical language	4	4
General Education	8	5
	15	15
Third Year	**A**	**S**
ENLI 465 Structure and History of English for Teachers	-	3
LIT 349L (ENLT 349L) Studies in Medieval Literature or LIT 350 (ENLT 350L) Chaucer	-	3
LING 472 Generative Syntax	3	-
LING 474 Historical Linguistics	3	-
LING 471 Phonetics and Phonology	3	-
Electives and General Education	6	9
	15	15
Fourth Year	**A**	**S**
LING 473S Language and Culture or 475 Linguistic Field Methods	3	-
LING 475 Linguistic Field Methods	-	3
LING 476 Child Language Acquisition	-	3
LING 477 Bilingualism (A) or 478 Second Language Development (S)	3	3
LING 489 Morphology	-	3
Electives	9(12)	6
	15	15

Linguistics Option (Teaching ESL)

First Year	**A**	**S**
WRIT 101 (ENEX 101) Composition (Last name A-L in autumn; M-Z in spring)	3	(3)
LIT 221L, 222L, 210L, 211L (ENLT 218L, 219L, 224L or 225L) (British or American Literature)	(3)	3
Modern or Classical language	5	5
General Education	4	4
	15	15
Second Year	**A**	**S**
LIT 220L (ENLT 217L) British Literature	3	-
LIT 221L, 222L, 210L, 211L (ENLT 218L, 219L, 224L or 225L) (British or American Literature)	-	3
LING 470 Introduction to Linguistic Analysis	-	3
Modern or Classical language	4	4
General Education	8	5
	15	15
Third Year	**A**	**S**

ENLI 465 Structure and History of English for Teachers	-	3
LING 471 Phonetics and Morphology	3	-
LING 472 Generative Syntax	3	-
LING 477 Bilingualism (A) or 478 Second Language Acquisition (S)	3	(3)
LING 480 Teaching English as a Foreign Language	-	3
Linguistics upper-division elective	-	3
Electives and General Education	6	6
	15	15
Fourth Year	**A**	**S**
ENT 440 Teaching Writing	3	-
ENT 442 Teaching Oral Language and Media Literacy	-	3
LING 466 Pedagogical Grammar	3	-
LING 473 Language and Culture (A), 475 Linguistic Field Methods (S) or 476 Child Language Acquisition (S)	3	(3)
LING 481 ESL Professional	-	3
LING 491 ESL Practicum	-	1
Electives	6(9)	85
	15	15

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

English As a Second Language (EASL) - Course Descriptions

195, 250, 251, 450, 451

Composition (WRIT) - Course Descriptions

101, 191, 198, 201, 391, 398, 491, 492, 540, 595, 596,

Creative Writing (CRWR) - Course Descriptions

110L, 195, 210A, 212A, 310, 311, 312A, 320, 322, 390, 395, 398, 410, 411, 412, 495, 496, 510, 511, 512, 513, 514, 515, 516, 595, 596, 599

Creative Writing (ENCR) - Course Descriptions

210A, 211A

Film (FILM) - Course Descriptions

103L, 191, 262L, 291, 300, 308, 320, 327, 363, 365, 381, 391, 447, 448, 484, 481, 491, 492

English Teaching (ENT) - Course Descriptions

English teaching courses, due to their strictly-enforced pre- and co-requisites, may only count as electives for the Literature, Film Studies, and Creative Writing major options.

395, 398, 439, 440, 441, 442, 495, 496, 542, 543, 544, 545, 546, 547, 548, 550, 551, 552, 553, 556, 557, 593, 595, 596, 598

Literature (LIT) - Course Descriptions

110L, 120L, 191, 201, 210L, 211L, 220L, 221L, 222L, 270L, 300, 301, 304, 305, 314, 315, 316, 327, 331, 332, 335, 342L, 343, 349L, 350L, 351, 353, 355, 357, 358, 362, 363, 369, 370, 373, 375, 376, 378L, 391, 398, 420, 421, 429, 430, 491, 492, 494, 499, 500, 520, 521, 522, 524, 595, 596, 598, 599

Irish Studies (ENIR) - Course Descriptions

101, 102, 103, 201, 202, 249, 321, 325, 345, 360, 380, 395, 430

Faculty

Professors

Robert Baker, Ph.D., Cornell University, 1997

Jill Bergman, Ph.D., University of Illinois, 1999

Heather Bruce, Ph.D., University of Utah, 1997

Kevin Canty, M.F.A., University of Arizona, 1993

Casey Charles, Ph.D., State University of New York, Buffalo, 1992

Beverly Ann Chin, Ph.D., University of Oregon, 1973

Debra Magpie Earling, M.F.A., Cornell University, 1991

John Glendening, Ph.D., Indiana University, 1992

Brady Harrison, Ph.D., University of Illinois, 1994

John Hunt, Ph.D., Stanford University, 1984 (Chair)

Christopher J. Knight, Ph.D., New York University, 1982

Deirdre McNamer, M.F.A., The University of Montana, 1987

David L Moore, Ph.D., University of Washington, 1994

Greg Pape, M.F.A., University of Arizona, 1974

Karen Volkman, M.F.A., Syracuse University, 1992

Associate Professors

Judy Blunt, M.F.A., The University of Montana, 1994

Nancy Cook, Ph.D., State University of New York, Buffalo, 1991

Louise Economides, Ph.D., Indiana University, 2003

Kathleen M. Kane, Ph.D., University of Texas, 1997

Ashby Kinch, Ph.D., University of Michigan, 2000 (Associate Chair)

Joanna Klink, Ph.D., The John Hopkins University, 2000

Eric Reimer, Ph.D., University of Oregon, 2002

Prageeta Sharma, M.F.A., Brown University, 1995

Assistant Professors

Rob Browning, Ph.D., Indiana University, 2004 (visiting)

Quan Manh Ha, Ph.D., Texas Tech University, 2011

David Gates, B.A., University of Connecticut, 1972

Lecturers

David Gilcrest, Ph.D., University of Oregon, 1996

Sean O'Brien, Ph.D., University of Colorado, 1989

Traolach O'Riordain, Ph.D., National University of Ireland, Co. Cork, Ireland, 1994

Robert Stubblefield, M.F.A., University of Montana, 1994

Emeritus Professors

Richard R. Adler, Ph.D., University of Illinois, 1971

William Bevis, Ph.D., University of California, Berkeley, 1969

Jesse Bier, Ph.D., Princeton University, 1956

Bruce Bigley, Ph.D., Yale University, 1972

Gerry Brenner, Ph.D., University of Washington, 1965

Walter L. Brown, Ph.D., University of California

Merrel D. Clubb, Jr., Ph.D., University of Michigan, 1953

Phil Fandozzi, Ph.D., University of Hawaii, 1974

Earl Ganz, Ph.D., University of Utah, 1977

Robert B. Hausmann, Ph.D., University of Wisconsin, 1972

Walter N. King, Yale University, 1952

William Kittredge, M.F.A., University of Iowa, 1969

Michael W. McClintock, Ph.D., Cornell University, 1970

Jocelyn Siler, M.F.A., The University of Montana, 1977

Lois Welch, Ph.D., Occidental College, 1966

Emeritus Associate Professors

Robert B. Johnstone, Ph.D., University of Washington, 1970

Dexter Roberts, Ph.D. Stanford University, 1966

Veronica J. Stewart, Ph.D., State University of New York, Stony Brook, 1990

Environmental Studies

Phil Condon, Director

The Environmental Studies Program (EVST) seeks to provide students with the literacy, skills and commitment needed to foster a healthy natural environment and to create a more sustainable, equitable, and peaceful world. To these ends, the EVST program educates and challenges students to become knowledgeable, motivated, and engaged in environmental affairs. We want our students to acquire the skills and awareness that will enable them to promote positive social change and to improve the environment and communities of Montana and thereby the lives of all Montanans. Our program is organized upon the following principles:

- -Environmental studies require an interdisciplinary approach that integrates the natural sciences, social sciences, and humanities.
- -Creating solutions to environmental problems requires enterprise and performance as well as reflection; therefore, an effective environmental education generates thinkers who can do as well as doers who can think.
- -It is important to provide both classroom and experiential learning opportunities in the arts and responsibilities of democratic citizenship, including communication, collaboration, and committed civic participation.
- -Students should be co-creators of their educational experience.

High School Preparation: Students in high school who are planning to major in environmental studies should take their schools' college preparatory curriculum. Courses in biology, chemistry, math through pre-calculus, and writing are recommended.

Special Degree Requirements

Refer to graduation requirements listed previously in the catalog (see index). For the Bachelor of Arts degree, every major in environmental studies will complete the following requirements:
Environmental Studies: ENSC 105N (EVST 101N), ENST 230H, 201, 225, ENSC 360, ENST 398 (EVST 167H, 201, 225, 360, 398), one of the following two courses: ENST 382 or 367 (EVST 302 or 367), one of the following two courses: ENST 335 L or 430 (EVST 305L or 430), one of the following two courses: ENST 489S or 487 (EVST 477S or 487), and at least 9 credits selected from 300 and/or 400 level courses offered by Environmental Studies (of which no more than 3 credits may be from EVST 382, 383 or PTRM 418 (EVST 418) or ENST 395 in the current catalog).
Required courses outside Environmental Studies: BIOB 101N or BIOB 160N or BIOB 170N (BIOL 100N or 110N or 108N); CHMY 121N (CHEM 151N); STAT 216 (MATH 241), and one, 3 credit NAS course from among the following: NASX 105H, 231X, 303E, 304E, 354X, 340, 306X, or 488 (NAS 100H, 231, 303E, 301E, 324X, 329, 341, or 410) or NASX 201X, 235X (NASL 201X, 202L (NAS 201H, 202)), a two semester foreign language sequence, and one additional environmental science course from among the following: ERTH 303N/GPHY 322N, GEO 108N (GEOS 108N) (provided it was not used to satisfy the first requirement listed above), BIOB 170N, BIOO 335 (BIOL 108N, BIOL 350), NRSM 265 or 385 (FOR 265 or FOR 385).
The Upper-division Writing Expectation must be met by successfully completing an upper-division writing course from the approved list in the Academic Policies and Procedures section of this catalog. See index.

Focus Areas of Study for Undergraduates

All Focus Areas of Study require the completion of the general requirements of the EVST major. In addition, each Focus Area has additional special requirements below.

Sustainability Studies:

Sustainability is a major organizing theme within Environmental Studies. Students focusing on this area will increase their understanding of our earth's limited capacity to support all forms of life and to provide for the needs of human society.

Students will learn how to reduce our demands on the earth through increased resource efficiency and choosing simpler but more joyful lifestyles. Students have the opportunity to identify and develop more sustainable means of providing food, shelter, mobility and other necessities by working and innovating in the local community. Students complete 20 credits of advisor-approved courses and/or internships and may further focus their studies in these areas.

Sustainable Business: Students focus on creating and maintaining enterprises that meet social needs sustainably. Students should take ENST 291 (EVST 210) or TASK 160S (BUS 160S); ACTG 201 & 202 (ACCT 201 & 202); MIS 257 (IS 257); ENST 476 or 487 (EVST 485 or 487); COMX 349 (COMM 379); BMGT 357 (MGMT 457). Students should also intern with a local sustainable business or the Sustainable Business Council. Students interested in this focus area are encouraged to double major in Business Management and in addition to the core Business courses take some of these courses: BMGT 430, 426, 458 (MGMT 430, 446, 458). Faculty Advisor - Vicki Watson

Sustainable Energy: Students interested in sustainable energy should take ENST 204, 291, 480, and 494, (EVST 204, 210, 450, 460 and 470) and the energy related courses offered by the College of Technology. Students should arrange an

energy related internship. Also recommended are ECNS 201S, 433 (ECON 111S, 440). Faculty advisors - Len Broberg and Josh Slotnick

Sustainable Food and Farming: Students focus on creating and maintaining sustainable food systems. Students must complete 6 supervised internship credits in the Program in Ecological Agriculture and Society (PEAS, ENST 396 (EVST 390)); ENST 430 and 480 (EVST 430 and 450). In addition, students must complete 9 more credits of advisor-approved courses or internships. These could include courses such as: ENSC 245N, (FOR 210N), ANSC 262 (FOR 362), NRSM 424 (FOR 424); NUTR 221N (HHP 236N); PHAR 324; ANTY 133H (ANTH 103H); GPHY 434 (GEOG 434). Faculty advisors Neva Hassanein and Josh Slotnick.

Sustaining Water Resources & Watersheds: Students focus on sustainable use of water resources and watersheds. Students must complete 20 credits of advisor-approved courses or internships. These could include courses such as BIOO 340, BIOE 428, BIOO 409, (BIOL 308, 366, 408)BIOL 415, BIOL 453, 454; CHMY 442 (CHEM 442); GPHY 335 (GEOG 335); GEO 260, 301, 320, 327, 460, 420 (GEOS 260, 301, 320, 327, 460, 480); ENSC 245N (FOR 210N), NRSM 385 & 386, 415, 455, 485 (FOR 385 & 386, 415, 455, 485). (Note: Some of these courses require prerequisites not in the environmental studies core requirements.) Students can also work with the UM Watershed Health Clinic. Faculty advisor - Vicki Watson

Environmental Justice: With this focus area students will develop the capacity for thoughtful active participation in the quest for environmental and social justice. Students gain in-depth understandings of a wide range of environmental injustices and the role of race, class, and gender in shaping quality of life, enjoyment of environmental amenities and access to natural resources both domestically and internationally. Students learn about the ways that business, government, financial institutions, and the labor and environmental movements can work toward a more just and sustainable society. Students must complete 21 credits including the following: ENST 489S, 487 (EVST 477S, 487), a 3 credit internship ENST 398 (EVST 398) and 12 credits of advisor-approved electives (contact Robin Saha for a list of recommended courses). Faculty advisors - Robin Saha and Dan Spencer.

Environmental Science: Students will develop sufficient science literacy to qualify as environmental scientists. Students should double major or minor in one of the scientific disciplines on campus and/or consult with the EVST science advisor to design a course of study that includes at least 40 credits in science & math. Faculty advisor - Vicki Watson.

Environmental Writing and Literature: Students focus on the careful reading of American Nature & Environmental Nonfiction Writing and the creative writing of their own work in the field. Students must complete ENST 335L and 373A (EVST 305L, 373A); at least one 3 credit course at the 200-level or above in CRWR (ENCR) or LIT or JRNL (JOUR); at least either one internship credit (*Camas* magazine, the Environmental Writing Institute, *Wild Mercy* Reading Series, or some other environmental publication); or one independent study credit ENST 492 (EVST 496), arranged with instructor in either original nature writing or in nature literature study. Faculty advisor - Phil Condon

Environmental Pre-Law: The Pre-Law focus area of study is designed to prepare students for law school and a career in environmentally oriented legal and policy matters. Students focusing on environmental law must consult with the pre-law faculty advisor within environmental studies (Len Broberg) to design a suitable pre-law program. The pre-law focus area is a flexible program that allows students to strengthen their background within their area of interest. Faculty advisor - Len Broberg

Suggested Course of Study

First Year	**A**	**S**
BIOB 101N (BIOL 100N) Discover Biology	3	-
WRIT 101 (ENEX 101) Composition	(3)	(3)
ENSC 105N (EVST 101N) Environmental Science	3	-
ENST 230H (EVST 167H) Nature and Society	-	3
M 115 (MATH 117) Probability and Linear Mathematics	-	3
NASX 105H (NAS 100H) Introduction to Native American Studies	3	-
Elective and General Education	4-7	7-10
Total	16	16
Second Year	**A**	**S**
CHMY 121N (CHEM 151N) Intro to General Chemistry	3	-

ENST 201 (EVST 201) Environmental Information Resources	-	3
ENST 225 (EVST 225) Community and Environment	3	-
STAT 216 (MATH 241) Intro to Statistics	4	-
Foreign Language sequence	3-5	3-5
Electives, additional Environmental Science or Studies courses and/or General Education	-	7
Total	15	15
Third Year	**A**	**S**
ENST 367 (EVST 367) Env. Politics & Policy (or ENST 382 (EVST 302) Environmental Law)	(3)	(3)
ENSC 360 (EVST 360) Applied Ecology	3	-
ENST 335L (EVST 305L) The Environmental Vision (or ENST 430 (EVST 430) Culture & Agriculture)	(3)	(3)
Environmental Science or Studies upper-division course	3	3
Electives, additional Environmental Science or Studies courses and/or General Education	6	6
Total	15	15
Fourth Year	**A**	**S**
ENST 489S (EVST 477S) Env. Justice Issues & Solutions (or ENST 487 (EVST 487) Globalization Justice & Env)	(3)	(3)
Environmental Science or Studies upper-division course	(3)	(3)
ENST 398 (EVST 398) Cooperative Education/Intern	(3)	(3)
Electives, additional Environmental Science or Studies courses and/or General Education	6	6
Total	15	15

Requirements for a Minor

To earn a minor the student must complete 25 credits. The following courses must be completed: ENSC 105N (EVST 101N), ENST 230H, 225, (EVST 167H, 225) and one of these ecology courses: BIOE 172N (BIOL 121N), ENSC 360 (EVST 360), FORS 330 (FOR 330), or BIOE 370 (BIOL 340). The remaining credits can be from any other upper-division Environmental Science or Studies courses.

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Environmental Studies (ENST) - Course Descriptions

201, 204, 225, 230H, 291, 294, 295, 335L, 367, 373A, 377, 382, 391, 395, 396, 398, 420, 430, 476, 480, 487, 489S, 491, 492, 493, 494, 499, 502, 204, 505, 513, 515, 520, 521, 525, 531, 537, 542, 548, 555, 560, 561, 562, 563, 564, 565, 566, 567, 573, 575, 579, 590, 593, 594, 595, 596, 597, 598, 599

Environmental Sciences (ENSC) - Course Descriptions

105N, 191, 245N, 360, 398, 491, 492, 495, 501, 540, 550, 551, 594, 596, 598

Faculty

Professors

Len Broberg, Ph.D., University of Oregon, 1995

Phil Condon, M.F.A., M.S., The University of Montana, 1989, 2000 (Director)

Neva Hassanein, Ph.D., University of Wisconsin, 1997

Vicki Watson, Ph.D., University of Wisconsin, 1981

Associate Professors

Fletcher Brown, Ph.D., Miami University, 1994

Robin Saha, Ph.D., University of Michigan, 2002

Daniel Spencer, Ph.D., Master of Divinity, Union Theological Seminary, New York, 1994, 1983

Emeritus Professor

Thomas M. Roy, M.A., University of Chicago, 1966

Lecturer

Joshua Slotnick, MPS, Cornell University, 1995; Certificate in Ecological Horticulture, University of California Santa Cruz, 1991

Instructor

Rosalyn LaPier, M.A., DePaul University, 2000

Department of Geography

- Special Degree Requirements
- Suggested Course of Study
- Courses
- Faculty

Christiane von Reichert, Chair

Geography provides a broad-ranging perspective on humans as inhabitants and transformers of the face of the earth. The search for this understanding involves thorough study of the physical earth, its habitation by humans, and the resulting diversity of regions and places. Geographers study the physical earth by examining the interlocking systems of the natural environment, including climate, landforms, soils, and biota. Humans are studied by examining those diverse historical, cultural, social, economic, and political structures and processes which affect the location and spatial organization of population groups and their activities. Regions and places, whether described as nations, cities, ecological units, or landscapes, are studied by integrating and interpreting their physical and human relationships in an effort to better understand them and the problems that they face.

Geographers are often found working in business, industry, government, and education. Those in planning might be called upon to determine the most satisfactory location for a new school or an airport, or undertake the environmental or socioeconomic studies required for community and regional planning. Others enter fields such as environmental law, diplomacy, intelligence, and teaching. Graduates trained in cartography and Geographical Information Systems find professional opportunities creating digital maps and doing spatial analysis for a wide array of government entities. No academic discipline offers a greater range of employment opportunities.

The Department of Geography maintains particular strengths in each of the following major branches within the discipline: 1) physical geography (geomorphology, mountain environments, climate and global change); 2) human–environment interaction (environmental rehabilitation, water policy, and mountain-society interactions); 3) geography and society (sustainable cities, economic geography of rural areas, and migration and population change); 4) regional geography (with particular strengths in the geography of Montana, North America, Africa, Asia, and Europe); 5) geographical techniques (cartographic principles and design, Geographic Information System GIS, remote sensing, transport planning and GIS-T, field methods, quantitative and qualitative method).

The Department of Geography offers the Bachelor of Arts, Bachelor of Science, Master of Arts and Master of Sciences degrees in geography. For a B.A. in geography, an option in community and environmental planning is available. For a B.S. in geography an option in physical geography is available. Also offered are a minor in geography and a teaching major and minor in geography. Several interdisciplinary minors are available to students: a minor in mountain studies, a minor in climate change and a minor in international development studies. The bachelor degree program provides a broad liberal education, it qualifies graduates for a variety of professional jobs, and it prepares students who excel for graduate studies in geography, planning, GIS, or related fields. Graduate programs prepare candidates for a relatively greater range of employment, including teaching in community and junior colleges, and for doctoral studies in geography and allied disciplines. In addition to a general degree in geography without option, students may pursue an option within the M.S. program in the following areas: community and environmental planning, or cartography and GIS. See the Graduate School website for more information concerning the M.A. and M.S. programs.

A certificate in GIS Sciences and Technologies, jointly offered by the Department of Geography (College of Arts and Sciences) and the Department of Forest Management (College of Forestry and Conservation), is also available. This GIST certificate is a complement to an existing major or to a bachelor's degree already obtained. For details, please see below or the GIST website.

Special Degree Requirements

Refer to graduation requirements listed previously in the catalog. See index.

General Education Requirements for Geography Majors

Geography majors must meet the mathematical literacy requirement by taking M 115 (MATH 117) or an M or STAT course higher than 150. Students obtaining a B.A. geography degree without an option, may meet the university-wide symbolic system requirement either by taking one year of foreign language instruction (100-level or higher) or by taking M 115 (MATH 117) and STAT 216 (MATH 241). Students choosing the CEP option must meet the university-wide symbolic system requirement by taking M 115 (MATH 117) and STAT 216 (MATH 241). Students obtaining a geography B.S. degree (with or without an option) must meet the symbolic systems requirement by taking M 115 and STAT 216 (Math 117 and Math 241), or just one of M 162, M 181H, or STAT 451 (Math 150, 152H, or 444). Regular calculus M 171 (Math 152) is strongly recommended. The upper-division writing expectation for the B.A. (with or without option) must be met by successfully completing an upper-division writing course from the approved list in the Academic Policies and Procedures section of this catalog (see index), or by writing a senior thesis in geography. Those students completing the B.S. degree must select a science-based writing class for their writing course (GPHY 335 (GEOG 335), GEO 320 (GEOS 320), GEO 499 (GEOS 499), BIOO 470 (BIOL 304), BIOO 475 (BIOL 306), etc.) approved by their advisor or complete a senior thesis in geography.

Requirements for a Major in Geography

A major in geography requires a minimum of 36 (maximum of 60) credits. All geography majors take a 25-credit core consisting of the following courses: GPHY 111N (GEOG 102N), GPHY 112 (GEOG 105), GPHY 121S (GEOG 101S), GPHY 284 (GPHY 381 and 382), GPHY 385 (GEOG 385), GPHY 141S (GEOG 103S) or other regional course, three 300- or 400-level courses, one each from the systematic emphases of physical geography, human-environment interaction, and geography and society.
Students who pursue a B.S. degree or an option in physical geography, or in community and environmental planning, also must meet the course requirements of the option (see below).

General Geography B.A.

The general geography B.A. degree (without option) is very flexible. In addition to meeting the core requirements for all geography majors, students may take a wide range of electives in geography (minimum 11, maximum 35 elective credits). Electives may be chosen from the fields of regional geography, geographic methods and techniques, or systematic geography (physical geography, human-environment interaction, or geography and society).

General Geography B.S.

The B.S. in Geography is designed to accommodate those students who are interested in pursuing more science-based and technical areas of study and work in the field of Geography, such as aspects involving physical geography and geospatial technologies, or environmental planning. Those pursuing a geography B.S. degree (with or without an option) must complete 6-10 additional credits (a two-course sequence) of science coursework. The classes must be selected and approved by the student and advisor as appropriate to individual student goals (e.g., BIOO 105N (BIOL 120N), BIOE 172N (BIOL 121).

Physical Geography Option

In addition to satisfying the general requirements for a B.S. degree in geography, a student pursuing the option in physical geography must complete additional requirements, including ERTH 303N (GEOG 322N), GPHY 317 (GEOG 324), and GPHY 411N (GEOG 426N), though substitutions which broaden the students curriculum may be approved by their advisor. Also, students must complete an additional appropriate math course above the 150 level to complement the one used to fulfill their symbolic systems requirements (the second semester of Calculus is recommended), and the two-course sequence in science

used to fulfill the B.S. requirement MUST be one of the following: CHMY121N-123N (CHEM 151N-152N), CHMY 141N-143N (CHEM 161N-162N), PHSX 205N-207N (PHYS 121N-122N), PHSX 215N-217N (PHYS 211N- 212N), or BIOO 105N (BIOL 120N), BIOE 172N (BIOL 121N)).

Community and Environmental Planning Option

In addition to satisfying the general requirements for a B.A. degree in geography, the student desiring to achieve an option in community and environmental planning must complete: GPHY 465 (GEOG 465), at least one of the following two courses: GPHY 468 (GEOG 468) or GPHY 486 (GEOG 486) (with corequisite laboratories GPHY 469 (GEOG 469) or GPHY 489 (GEOG 489)), plus four of the following five courses: GPHY 323S (GEOG 315S), GPHY 335 (GEOG 335), GPHY 421 (GEOG 412S), GPHY 432 (GEOG 432), GPHY 435 (GEOG 435). (These courses can be used to satisfy the 300- or 400-level core requirement in geography and society, and human-environment interaction.) An internship is strongly recommended.

Requirements for a Minor in Geography

To earn a minor in Geography, the student must complete a minimum of 19 credits including: GPHY 111N (GEOG 101S and 102N); GPHY 121S and GPHY 141S (GEOG 103S) or other regional course; GPHY 112 (GEOG 105), GPHY 284 (GPHY 381 and 382), or GPHY 385 (GEOG 385); two upper-division systematic courses from the fields of physical geography, geography and society, and human-environment interaction.

Minor in Mountain Studies

Mountain Studies is an interdisciplinary field of study focusing on the physical and human dimensions of mountain environments. Coursework in the minor emphasizes physical geography and mountain-society interactions, including a critical analysis of the processes of change and influence shaping local and regional mountain environments today. The minor in Mountain Studies takes advantage of existing faculty expertise and an array of courses to provide students with a science-based curriculum and global perspective. Students pursuing the minor in mountain studies will develop knowledge and skills appropriate for graduate study and for working with government and non-government agencies and groups.

General Requirements

In addition to completing the requirements for a major in any discipline, students electing the minor in Mountain Studies must complete a minimum of 18 additional credits as follows:

1. Six credits must be core courses:

GPHY 314 Global Mountain Environments (3 cr.)

GPHY 338 Mountains and Society (3 cr.)

2. Six credits must be selected from the following list of region-specific mountain studies courses:

BIOL 342 Field Ecology (5 cr.) (summer field course at the Flathead Lake Biological Station)

BIOL 459 Alpine Ecology (3 cr.) (summer field course at the Flathead Lake Biological Station)

BIOO 101N Survey of Montana Wildlife & Habitats (3 cr.)

BIOO 335 Rocky Mountain Flora (3 cr.)

EVST 395/NRSM 311 Field Studies in Ecological and Human Communities; Section: Community and Conservation in the Northern Rockies (3 cr.)

EVST 395/NRSM 311 Field Studies in Ecological and Human Communities; Section: Ecological Restoration in Greater Yellowstone (3 cr.)

EVST/PTRM 418 Winter Wilderness Field Studies (3 cr.)

EVST/RSCN 382 Biogeography of Northwest Montana (3 cr.)

GEO 231 Geosciences Field Methods (2 cr.)

GPHY 138 Montana's Mountains (3 cr.)

GPHY 344 Crown of the Continent (3 cr.)

GPHY 391 Environmental Geography of the Northern Rockies (3 cr.)

GPHY 442 Regionalism and the Rocky Mountain West (3 cr.)

GPHY 438 Mountain Field Study (3 cr.)

GPHY 444 High Asia (3 cr.)

NRSM/GPHY 352 Himalayan Environment and Development (3 cr.)

NRSM/GPHY 353 Tourism and Sustainability in the Himalaya (3 cr.)

3. Six credits must be selected from the following list of

upper-division advanced mountain studies courses:

BIOL 451 Landscape Ecology (field course at Flathead Lake Biological Station) (3 cr.)

FORS 330 Forest Ecology (3 cr.)

GEO 391 Special Topics (3 cr.)

GEO 433 Global Tectonics (3 cr.)

GEO 488 Snow, Ice and Climate (3 cr.)

GPHY 317 Geomorphology (3 cr.)

GPHY 411 Biogeography (3 cr.)

GPHY 538 Mountain Studies Seminar (3 cr.)

NAS 351 Traditional Ecological Knowledge in Action (3 cr.)

NRSM 311 Field Studies in Ecological and Human Communities; Section: Conservation Biology in the Northern Rockies (3 cr.)

NRSM 385 Watershed Hydrology (3 cr.)

PTRM 482 Wilderness and Protected Area Management (3 cr.)

Certificate in GIS Sciences and Technologies

The Certificate in GIS Sciences and Technologies, jointly offered by the departments of Geography, and Forest Management, is aimed at present or future professionals or scientists who require skills in GIS technologies. The purpose of this program is to provide undergraduate students or individuals possessing an undergraduate degree with the training, knowledge, and understanding necessary to acquire, process, analyze, and properly display digital geographic data.

Special Requirements for the Certificate

To earn a certificate in GIS Sciences and Technologies, students must either complete or have completed an undergraduate degree and complete a minimum of20 semester credit hours of course work, including 9 to 11 required credits and 9 to 11 elective credits as described below. Students must achieve at least an overall grade point average of 3.0 for courses within the program in order to earn a certificate. The certificate will be awarded upon the successful completion of all of the requirements

of the certificate and the undergraduate degree.

Background Courses:

It is recommended that students complete the university symbolic systems requirements before beginning this program because these courses promote basic quantitative reasoning (M 115 (MATH 117), STAT 216 (MATH 241), FORS 201 (FOR 201), SOCI 202 (SOC 202)).

Required Courses (9-11 cr.): All 3 of the following requirements must be fulfilled.

1. GPHY 284 Introduction to GIS and Cartography - 3 cr. autumn/spring (Prior to Fall 2013 this was fulfilled by either FORS 250 and 350 or GPHY 381 and 382)

2. FORS 351 (FOR 351) Photogrammetry and Remote Sensing - 3 cr. spring

OR

GPHY 487/489 (GEOG 487/489) Remote Sensing & Raster GIS (3 cr.) & Lab (1 cr.) - 4 cr. autumn

3. FORS 350 (FOR 350) Geographic Information Systems and Applications - 3 cr. spring

OR

GPHY 488/489 (GEOG 488/489) Thematic Cartography and GIS (3 cr.) and Lab (1 cr.) - 4 cr. spring

Advanced Elective Courses (9-11 cr.): (Although elective courses are organized by topical specialty, no specialization is necessary). Additional and experimental courses are offered intermittently; please see faculty or website for current semester offerings. Faculty may submit course syllabi to the GIS Certificate Committee for possible inclusion in the Certificate.

Raster GIS, Remote Sensing, and Image Analysis

G GPHY 587/589 (GEOG 587/589) Image Analysis and Modeling (3 cr.) and Cartography/GIS Lab 91 cr.) - 4 cr. odd spring

G FORS 551 (FOR 551) Digital Image Processing - 3 cr. varies

Vector GIS and Networks

UG GPHY 486/489 (GEOG 483/489) Transport Planning and GIS (3 cr.) and Cartography/GIS Lab (1 cr.) - 4 cr. winter or spring

G GPHY 588/589 (GEOG 588/589) Vector GIS (3 cr.) and Cartography/GIS Lab (1 cr.) - 4 cr. autumn

G GPHY 580 (GEOG 580) Seminar in GIS and Cartography - 3 cr. spring

Data Management and Programming

UG GPHY 468/469 (GEOG 468/469) Community and Regional Analysis (3 cr.) and Planning & Analysis Lab (1 cr.) - 4 cr. autumn

UG FORS 505 (FOR 505) Sampling Methods - 3 cr. spring

U CSCI 250 (CS 177) Computer Modeling for Science majors - 3 cr. autumn

GIS Applications

UG GPHY 385 (GEOG 385) Field Techniques - 3 cr. autumn, some spring

UG GPHY 467 (GEOG 467) Planning Decision Support Systems - 3 cr. some spring

UG GPHY 482/489 (GEOG 484/489) Spatial Analysis and GIS (3 cr.) & lab (1 cr.) - 4 cr. varies

UG GPHY 481 (GEOG 495) Digital Mapping & Advanced Cartographic Design - 3 cr. autumn

GPHY 564 (GEOG 564) Planning Design - 3 cr. even spring

FORS 503 (FOR 503) Predictive Distribution Modeling I - 3 cr. odd spring

WILD 562 (WBIO 562) Wildlife Habitat Modeling - 3 cr. odd fall

Note: It is a standard of The University of Montana that G designated courses can be taken only by graduate students or undergraduate students who have senior standing with an accumulative GPA of 3.0 or higher, and permission of the instructors.

No more than 4 credits of Independent Study or Internships can be used towards the Certificate.

Teacher Preparation in Geography

Students who want to be licensed to teach geography at the middle and high school level must complete the B.A. degree requirements in geography (general geography, no option required). They also must complete a teaching major or minor in a second field of their choice and the professional licensure program in the College of Education. Students may also earn a teaching minor in geography. See the Department of Curriculum & Instruction for information about admission to the Teacher Education Program and completion of the licensure program.

Additional Information for Majors

Advisor

Every geography major will be assigned a geography faculty member to act as advisor. The advisor offers assistance in designing a program and in monitoring progress. In addition to guiding students toward meeting degree requirements, advisors also can direct students toward special opportunities, such as study abroad and field experiences, as well as scholarship and internship opportunities. All course substitutions must be approved by the advisor. The advisor also reviews and initials a student's application for graduation before the application is signed by the chairperson.

International and Field Experience for Geographers

Students obtaining a degree in geography are strongly encouraged to explore study-abroad options and field experiences. Geography credits obtained through approved studies abroad will be applied toward the geography degree. With approval of the student's advisor, additional credits obtained through studies abroad and field experiences may count toward geography electives.

Suggested Course of Study

B.A. in Geography (General Geography without option):

First Year	A	S
GPHY 111N (GEOG 102N) Introduction to Physical Geography	3	-
GPHY 112 (GEOG 105) Introduction to Physical Geography Laboratory	1	-
GPHY 121S (GEOG 101S) Introduction to Human Geography	-	3
M 095 (MATH 100) Intermediate Algebra	3	–
M 115 (MATH 117) Probability and Linear Math	–	3
WRIT 101 (ENEX 101) College Writing I	3	–
Electives and General Education	5	9
Total	15	15
Second Year	**A**	**S**
GPHY 141S (GEOG 103S) Geography of World Regions or other regional geography course	3	–
STAT 216 (MATH 241) or 100–level foreign language	0–5	3–5
Electives and General Education	V	V
Total	15	15
Third Year	**A**	**S**
GPHY 284 (GPHY 381 and 382) Introduction to GIS and Cartography	3	–
GPHY 385 (GEOG 385) Field Techniques	3	–
Upper division courses in Physical Geography, Geography & Society, and Human–Environment Interaction	3–6	3–6
*Upper–division writing course	–	3
Electives including study abroad/internship	5	5

Total	15	15
Fourth Year	**A**	**S**
Electives including study abroad/internship/ senior thesis	15	15
Total	15	15

B.S. in Geography (General Geography without option):

First Year	**A**	**S**
GPHY 111N (GEOG 102N) Introduction to Physical Geography	3	–
GPHY 112 (GEOG 105) Introduction to Physical Geography Laboratory	1	-
GPHY 121S (GEOG 101S) Introduction to Human Geography	–	3
M 121 College Algebra	3	–
M 122 College Trigonometry	–	3
WRIT 101 (ENEX 101) College Writing I	3	–
Electives and General Education	5	9
Total	15	15
Second Year	**A**	**S**
GPHY 141S (GEOG 103S) Geography of World Regions or other regional geography course	3	–
Approved Science Sequence in Chemistry, Physics, or Biology	3–5	3–5
M 451 and M 452 Statistical Methods I and II	3	3
Upper division course in Physical Geography	-	3
Electives and General Education	4-6	4-6
Total	15	15
Third Year	**A**	**S**
GPHY 284 (GPHY 381 and 382) Introduction to GIS and Cartography	3	–
GPHY 385 (GEOG 385) Field Techniques	3	–
Upper division courses in Physical Geography, Geography & Society, and Human–Environment Interaction	3–6	3–6
*Upper–division writing course	–	3
Electives including study abroad/internship	5	5
Total	15	15
Fourth Year	**A**	**S**
Electives including study abroad/internship/ senior thesis	15	15
Total	15	15

B.A. in Geography with option in Community and Environmental Planning:

First Year: Same as General Geography

Second Year	**A**	**S**
GPHY 141S (GEOG 103S) Geography of World Regions, or other regional geography course	3	–
STAT 216 (MATH 241) Statistics	–	3
General Education and electives	12	12
	15	15

Third Year: Same as General Geography

Fourth Year	**A**	**S**
GPHY 465 (GEOG 465) Planning Principles and Processes	3	–
GPHY 468 /469 (GEOG 468/469) Community & Regional Analysis and Laboratory OR GPHY 486/489 (GEOG 486/489) Transport, Planning, and GIS and Laboratory	4	–
Upper–division courses in Geography & Society, and Human–Environment Interaction	3	3
Electives including study abroad, internship/senior thesis	5	12
	15	15

B.S. in Geography with option in Physical Geography:

First Year	**A**	**S**
GPHY 111N (GEOG 102N) Introduction to Physical Geography	3	–
GPHY 112 (GEOG 105) Introduction to Physical Geography Laboratory	1	-
GPHY 121S (GEOG 101S) Introduction to Human Geography	–	3
Approved Science Sequence in Chemistry, Physics, or Biology	3-5	3-5
M 151 (MATH 121) Precalculus	-	4
WRIT 101 (ENEX 101) College Writing I	3	-
Electives and General Education	4	6
Total	15	15
Second Year	**A**	**S**
GPHY 141S (GEOG 103S) Geography of World Regions or other regional geography course	3	–
M 171 and 172 (MATH 152 and 153) Calculus I and II	4	4
Upper division course in Physical Geography	3	3
Electives and General Education	5	8
Total	15	15
Third Year	**A**	**S**

GPHY 284 (GPHY 381 and 382) Introduction to GIS and Cartography	3	–
GPHY 385 (GEOG 385) Field Techniques	3	–
Upper division courses in Physical Geography, Geography & Society, and Human–Environment Interaction	3–6	3–6
*Upper–division writing course	–	3
Electives including study abroad/internship	5	5
Total	15	15
Fourth Year	**A**	**S**
Electives including study abroad/internship/ senior thesis	15	15
Total	15	15

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Geography (GPHY) - Course Descriptions

111N, 112, 121S, 141S, 144, 191, 191X, 199, 241, 243X, 245, 284, 291, 314, 317, 323S, 335, 336, 338, 342, 344, 347, 348, 352, 353, 378, 381, 382, 385, 391, 399, 411N, 413, 421, 423, 432, 433, 434, 435, 438, 442, 443, 444, 445, 465, 466, 467, 468, 469, 481, 482, 485, 486, 487, 488, 489, 491, 492, 497, 498, 499, 500, 504, 505, 515, 520, 525, 535, 538, 550, 560, 561, 562, 564, 578, 588, 589, 595, 596, 597, 598, 599

Earth Systems (ERTH) - Course Descriptions

303N

Faculty

Professors

Sarah J. Halvorson, Ph.D., University of Colorado-Boulder, 2000

David D. Shively, Ph.D., Oregon State University, 1999

Christiane von Reichert, Ph.D., University of Idaho, 1992

Associate Professors

Ulrich Kamp, Ph.D., Technical University of Berlin, 1999

Anna Klene, Ph.D., University of Delaware, 2005

Lecturers and Adjuncts

Richard Graetz, D.H.L. (Hon), The University of Montana, 2004

Kevin G. McManigal, M.S., The University of Montana, 2011

Emeritus Professors

John M. Crowley, Ph.D., University of Minnesota, 1964

Evan Denney, Ph.D., University of Washington, 1970

John J. Donahue, Jr., Ph.D., Syracuse University, 1971

Chris Field, Ph.D., University of California, Los Angeles, 1966

Jeffrey A. Gritzner, Ph.D., The University of Chicago, 1986

Darshan S. Kang, Ph.D., University of Nebraska, 1975

Paul B. Wilson, Ph.D., University of Nebraska, 1972

Department of Geosciences

- Special Degree Requirements
- Suggested Course of Study
- Courses
- Faculty

James R. Staub, Chairman

Human impact on Earth systems and reliance on Earth's resources will increase as human population and economic production grows. These impacts are creating "global grand challenges": complex, globally important problems that require an interdisciplinary approach. The most pressing grand challenges over the next decade will be resource scarcity/depletion (especially water and petroleum), adaption to and mitigation of climate change and natural hazards, and environmental stewardship of highly stressed physical and biological Earth systems. As University of Montana Geoscientists, we address these challenges in our research and teaching. We develop the knowledge to find and extract mineral and water resources, solve problems caused by using those resources and develop models of the past, present and future Earth. Faculty, staff, graduate students, and undergraduate students are helping Montana and the World develop a sustainable future.

Our Vision:

We will build and teach a fundamental understanding of Earth processes to benefit humankind and sustain Earth systems.

Our Goals:

1. Conduct geoscience research, including obtaining extramural funding to perform essential and transformative research.

2. Disseminate research findings by publishing in peer-reviewed journals and presenting at national and international scientific conferences.

3. Teach students how to learn from known sources of information and create new knowledge from their own research.

4. Engage all graduate students and selected undergraduates in research and publication.

5. Produce graduates competent in their disciplines who can perform well in field, laboratory and computational settings, and who are prepared to serve as high-quality professionals in geoscience and related fields.

6. Provide opportunities for students to work and learn in other countries through international research and learning opportunities.

7. Educate the general student population about the nature of science and basic scientific principles through the study of Earth and its natural systems.

8. Engage the public with important geoscience issues through outreach and community education.

UM Geosciences in the National Context

With B.S., M.S. and Ph.D. degrees, UM Geosciences is one of 120 Ph.D. granting Geoscience departments in the United States. U.S. News & World Report ranks the UM Geosciences program with Universities like Florida State, Michigan Tech, University of Georgia, University of Pennsylvania, and University of South Carolina. We are ranked above schools like University of Idaho, University of Missouri, UNLV, and Notre Dame.

Employment

Geoscientists completing our program are employed by private industry, federal, state, and local governmental agencies, environmental consulting firms, non-profit organizations, and by schools needing Earth Science teachers. Jobs in geosciences are available at the B.S., M.S. and Ph.D. levels. The M.S. degree is considered the main working professional degree. The Ph.D. degree is required for positions at universities and with organizations specializing in research. However,

there are ample opportunities for geoscience employment with the B.S. degree. Our graduates have a wide range of educational and employment opportunities. Over the last decade, 95% of our graduate program alumni are employed in Geosciences: 13% work for government, 23% for industry, 31% for consultancies and 2% for non-governmental organizations, 10% are teaching, and 17% went on for a Ph.D. UM Geosciences graduates have exceptional placement rates.

Undergraduate Degree Requirements

We offer three degree options/programs of study for the Bachelor of Science degree: Geosciences B.S., International Field Geosciences Joint B.S. with University of Cork (Ireland), and International Field Geosciences Dual B.S. with Potsdam University (Germany).

We also offer an Option in Earth Science Education (*see electronic catalog for detailed curriculum and course descriptions for each of these options*).

The Upper-division Writing Expectation must be met for all degree options by successfully completing an upper-division writing course from the approved list in the Academic Policies and Procedures section of this catalog or by completing GEO 499 (GEOS 499). See index.

Geosciences B.S.

This option is designed for students who seek post-graduate employment as a professional geoscientist or preparation for graduate study in geosciences. The following Geosciences core courses are required to earn this degree: GEO 101N (GEOS 100N), GEO 102N (GEOS 101N), GEO 211 (GEOS 200), GEO 225, GEO 228 (GEOS 228), and GEO 231 (GEOS 230).

At least 32 credits of Geosciences courses must be completed, including at least 6 courses of which a minimum of 18 are upper-division (300-400 level) credits.

In addition to completing the coursework in Geosciences, students must also complete a minimum of 30 credits in cognate sciences classes. Required are the following: PHSX 205N/206N-207N/208N or PHSX 215N/216N - 217N/218N (PHYS 111N/113N-112N/114N or PHYS 211N/213N-212N/214N); CHMY 141N/143N (CHEM 161N/162N); M 162/274 (MATH 150/158) or M 171/172 (MATH 152/153); plus 3 credits in Computer Science (modeling or programming).

Additional cognate science courses completed to meet the minimum sum of 30 credits may include additional courses in Chemistry, Computer Science, Math, and Physics above the listed minimum levels specified above. Biology 100N or above is also appropriate, but substitutions or other science courses must be approved by the student's advisor.

International Field Geosciences Joint B.S. Degree with University College of Cork (Ireland)

This option is designed specifically for students who seek to combine a rigorous education in the Geosciences with a yearlong international geosciences experience and an emphasis on field-based learning. It requires attending classes and living overseas. Students demonstrating a high level of performance at the University will be eligible for partial financial support as funds are available. Although most of the course work completed during the year abroad will take place at University College Cork (UCC) in Ireland, additional course work is required through Potsdam University in Germany. For students who satisfy all degree requirements, a joint B.S. degree in International Field Geosciences will be awarded by The University of Montana and the University College Cork.

The following UM Geoscience courses are required to earn this degree: GEO 101N ; GEO 102N; GEO 211; GEO 225; GEO 228, GEO 231; GEO 315; GEO 442 or 443; and GEO 429. Also required are a minimum of 12 credits in upper division UM Geoscience courses selected from among the following: GEO 305, 310, 311, 320, 327, 420, 433, 442, 443, 460, 491 plus GRMN 101/102 or ENIR 101/102.

In addition to Geosciences coursework completed at UM, students must complete one formal field course run by the Institute of Earth and Environmental Science at Potsdam University to sites in and around Europe (arranged in consultation with advisor) plus one formal field course module run by University College Cork, selected from GL 2016 (Easter Field Course - Dingle Peninsula), GL3019 (Easter Field Course - Western Scotland), ER3002 (Easter Field Course - North Clare) GL4008

(Easter Field Course - Central Greece) or another equivalent-level field course run by UCC and approved a prior by their UCC and UM advisors. In addition, while in residence at Cork, students must complete any nine of the following courses in consultation with their UCC and UM advisors: Sed. processes and petrology; Igneous and MM Petrology; Invertebrate Paleontology & Evol.; Plate Tect. & Global Geophys.; Igneous petrogenesis & Geochem; Metamorphism & Geochronology; Advanced Structural Geology; Sedimentary Environments; Stratigraphy & Geologic Maps; Environmental Geology; Terr.l Ecosystems through time; Micropaleontology & Palynology; Petroleum Geol. & Basin Analysis; Appl. Geophys. & Comp Apps.; Advanced Igneous Petrology; Hydrogeology.

Students seeking this degree must also complete one additional formal upper-level Geosciences course at Potsdam University during their year abroad. Recommended are courses that focus on computer-based visualization of geoscience data, using GIS or other visualization platforms. Along with the formal Geoscience course work completed at UM and abroad, students earning this degree must complete a minimum of 27 credits in cognate sciences classes, including the following: PHSX 205N/206N-207N/208N or PHSX 215N/216N - 217N/218N; CHMY 121N/123N or CHMY 141N/143N; M 162/274 OR M 171/172; three credits in Computer Science (modeling or programming), or GIS or Statistics. Also required is one year of college German, GRMN 101/102 or one year of college-level Gaelic (ENIR/IRSH 101 and ENIR/IRSH 102) and completion of general education requirements relevant to German and Irish culture and history.

International Field Geosciences Dual Degree with Potsdam University (Germany)

This option is designed specifically for students who seek to combine a rigorous education in the Geosciences with a year-long international geosciences experience and an emphasis on field-based learning. It requires attending classes and living overseas. Students demonstrating a high level of performance at the University will be eligible for partial financial support as funds are available. Although most of the course work completed during the year abroad will take place at University Potsdam in Germany, additional course work is required at the University College Cork in Ireland. For students who satisfy all degree requirements, a B.S. degree in International Field Geosciences will be awarded by The University of Montana and a second B.S. degree in International Field Geosciences will be awarded by Potsdam University. The following UM Geoscience courses are required to earn this degree: GEO 101N ; GEO 102N ; GEO 211 ; GEO 225 ; GEO 228, GEO 231 ; GEO 326 ; and GEO 429 . Also required are a minimum of 15 credits in upper division UM Geoscience courses selected from among the following: GEO 305, 310, 311, 315, 320, 327, 420, 433, 438, 443, 437, 442, 460, 491 .

In addition to Geoscience coursework completed at UM, the following overseas field-based Geoscience courses are required: BP15 (Field course France, run by Potsdam) or BW01 (Field course-Norway, run by Potsdam) or BW02 (Field course-Alps, run by Potsdam); plus one of the following courses offered by University College Cork; GL 2016 (Easter Field Course-Dingle Peninsula), GL3019 (Easter Field Course-Western Scotland), ER3002 (Easter Field Course-North Clare), GL4008 (Easter Field Course-Central Greece) or another equivalent-level field course run by UCC and approved a priori by their Potsdam and UM advisors. Students seeking this degree must also complete any four of the following courses offered by Potsdam University: Regional Geology; Paleoclimate & Quaternary Geology; Analysis of Geologic maps; Analytic Geochemistry; Natural Hazards; Tectonophysics & Rheology; Seismology; Seismics; Geoelectrics; Sedimentary systems & stratigr. Geomorphology; Tectonics and geodynamics.

Along with the formal Geoscience course work, students earning this degree must complete a minimum of 27 credits in cognate sciences classes, including the following: PHSX 205N/206N-207N/208N or PHSX 215N/216N - 217N/218N; CHMY 121N/123N or CHMY 141N/143N; M 162/274 or M 171/172; three credits in Computer Science (modeling or programming), or GIS or Statistics. While overseas, the students must complete two additional cognate science courses at Potsdam University. Also required is one year of college German GRMN 101/102 and completion of general education requirements relevant to German and Irish culture and history.

Option in Earth Science Education

Major Teaching Field of Earth Science: A student must complete GEO 101N, 102N, 105N or 108N, 211, 228, 226, 231, 304, 311, 3 additional credits from any geosciences course numbered 300 or above. Also required are, ASTR 131N, M 151, STAT 216, CHMY 121N, CHMY 123N, 485, PHSX 205N/206N, PHSX 207N/208N and EDU 497. For endorsement to teach earth science, a student also must gain admission to the Teacher Education Program and meet the requirements for teaching

licensure (see the College of Education section of this catalog). Students must complete the requirements for the required second teaching endorsement (major or minor). Students should develop their course of study with an Education advisor.

Suggested Course of Study

Students enter our degree program from a number of different directions. Yet, our general advising remains the same. Students should plan on starting their math and chemistry sequences as freshman and beginning the physics sequence as sophomores. The following is provided as a planning guideline for the B.S. Geosciences degree option and assumes adequate high-school preparation in mathematics, chemistry and physics. If more preparation is needed in those disciplines, the student should develop a course of study with a Geosciences Department advisor. Students pursuing either of the International Field Geosciences B.S. degree programs (IFG-dual or IFG-joint) should see the IFG advisor to develop a course of study that meets those requirements because they are substantially different than the Geosciences B.S. degree program.

Geosciences B.S.

First Year	A	S
CHMY 141N (CHEM 161N) College Chemistry I	5	-
CHMY 143N (CHEM 162N) College Chemistry II	-	5
M 171 (MATH 152) Calculus I	4	-
M 172 (MATH 153) Calculus II	-	4
GEO 101N/102N (GEOS 100N/101N) Intro to Physical Geology	4	-
GEO 211 (GEOS 200) Earth History and Evolution	-	2
General Education & WRIT 101 (ENEX 101) College Writing (as needed)	3	4
Total	16	15
Second Year	**A**	**S**
GEO 225 Earth Materials	4	-
GEO 228 (GEOS 228) Earth Surface Processes	-	2
GEO 231 (GEOS 230) Geosciences Field Methods	-	2
PHSX 215 & 216 (PHYS211N/213N) Fundamentals of Physics with Calc I & Lab	5	-
PHSX 217N/218N (PHYS 212N/214N) Fundamentals of Physics with Calc II & Lab II	-	5
Electives and General Education	6	6
Total	15	15
Third Year	**A**	**S**
GEO at 300 level or above	6/8	-
GEO at 300 level or above	-	6/8
GIS/Computer Science/Statistics	3/4	-
Electives and General Education	3/6	7/9
Total	15	15
Fourth Year	**A**	**S**
GEO at 300 level or above[1]	3/4	3/4
Upper Division Writing Course or Senior Thesis[3] (GEO 320 or 499)	3	3
Additional cognate science or Independent Research[2]*	3/2	3/2
Electives and General Education	6	6
Total	15	15

1. A total of 30 additional science credits are required. See special degree requirements. 2. GEO 429 (6 cr), Field Geology can also be taken in the summer to meet upper division Geosciences course requirements. 3. A Senior Thesis must be approved and mentored by a Geosciences faculty member and should be started no later than the fall of the student's senior year and completed by the end of spring semester.

Requirements for a Minor

To earn a minor in Geosciences the student must complete at least 18 credits in Geoscience courses. A typical sequence is, GEO 101N (or 105N or 108N), and GEO 102N, 211, 226, 228 and 231; plus 300-400 level Geoscience courses for a total of 18 credits or more. However, any sequence of Geoscience courses is acceptable with the consent of a Geoscience advisor. All courses must be taken for a traditional letter grade, and meet the minimum university grade requirements for major and minor course work (C-).

Courses

R- before the course description indicates the course may be repeated for credit to the maximum indicated after the R. Credits