

Biology Handbook

A student's guide through
the BIO POE at Juniata

Juniata College

2016

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The Biology Department mission is to:

- Provide students with a fundamental knowledge of Biology.
- Prepare students for the workforce and graduate and professional schools.
- Strengthen the reading, writing and quantitative skills of our students.
- Develop the analytical reasoning skills of our students.
- Expose students to contemporary research techniques in Biology and enhance their understanding of the scientific method.
- Conduct meritorious research in the field of Biology
- Provide the entire student body with an appreciation of the social and economic implications of discoveries in Biology.
- Build the awareness of all Juniata College students of the ethical and moral issues related to tenets in Biology.

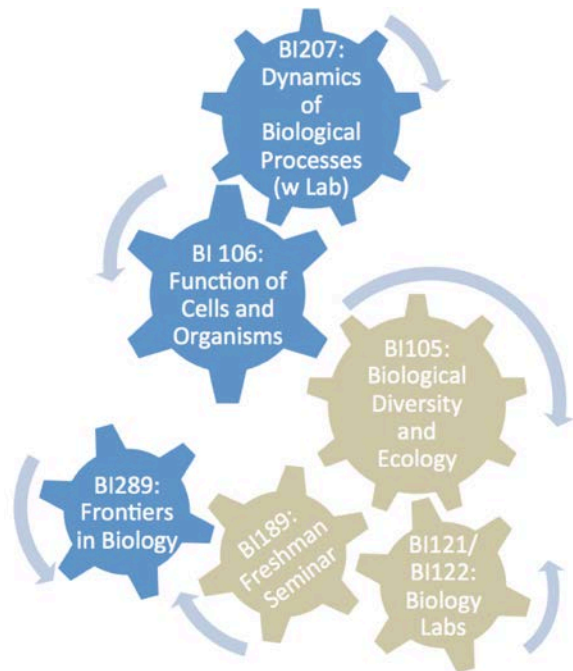
Learning outcomes

- Demonstrate knowledge of fundamental principles in biology.
- Demonstrate the application of quantitative skills in biology.
- Demonstrate knowledge of scientific inquiry, including
 - critical assessment of the scientific literature
 - generating hypotheses
 - experimental design
 - interpretation of data.
- Demonstrate science communication skills through written and verbal communication.
- Understand the best practices for science ethics and responsible conduct of research.
- Attain the technical and/or analytical skills required for employment, professional careers or post-graduate education in biology or biology-related careers.



Welcome to the Biology Program Of Emphasis.

Biology is an interdisciplinary field that requires a background in many subjects and skillsets. Thus, the designated Biology POE is designed to help you explore many facets within biology. Our introductory courses provide a broad knowledge of many biology sub-disciplines. Our upper level biology courses provide in-depth analysis of advanced material, particularly in small classroom settings.



Introductory courses

BI 105: Biological Diversity and Ecology
BI 106: Function of Cells and Organisms
BI 121/122: Biology Lab I and II (Genetics, Ecology, Microscopy, Toxicology)
BI 207: Dynamics of Biological Processes + Lab
BI 289: Frontiers of Biology (research seminars)

Upper level biology. Biology is an interdisciplinary scholarship. Understanding and connecting diverse fields requires a strong foundation in mathematics, chemistry and physics, and advance coursework that covers the breadth of Biology: cells and molecules, ecology and evolution, the systems that make living things work, as well as knowledge of the full diversity of organisms. You complete

upper level courses and labs that cover four basic cores areas: **Cellular and Molecular, Organismal, Ecology/Evolution, and Interactions.**

Labs

Two semesters of introductory lab are designed to introduce students to the concepts and laboratory techniques that are the basis of study of any biological area: electrophoresis of DNA and proteins, microscopy, and field research methods.

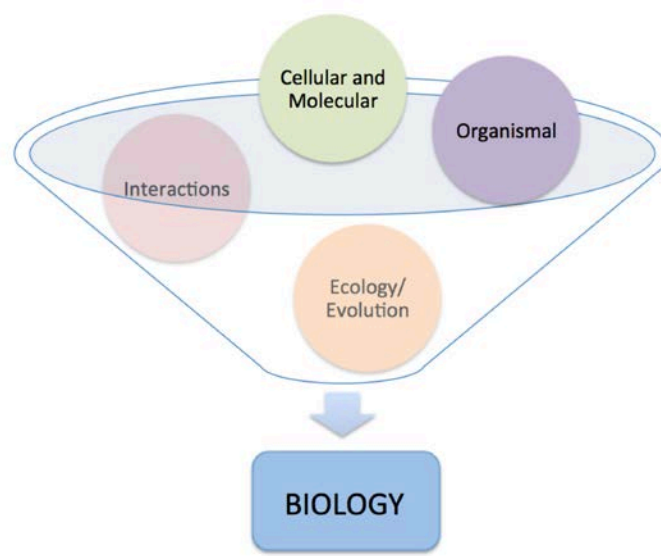
Interdisciplinary Study

All biology students are required to complete a minimum of:

Chemistry: three courses in chemistry, covering organic and inorganic chemistry

Physics: Two semesters

Math: Calculus or Biostatistics



BIO POE: Specific Requirements


Courses must be taken in the following disciplines:

*Substitutions and transfer credit require the approval of the Biology Department.

Course Number	Title	Credits	Prerequisites	Dist.	Skills
Biology					
BI 105	Biological Diversity and Ecology	3		N	
BI 106	Functions of Cells and Organisms	3	BI 105 and CH 105	N	
BI 121	Biology Lab I	1	corequisite BI 105	N	QS
BI 122	Biology Lab II	1	BI 105 & BI 121	N	QS
BI 289	Frontiers of Biology	1			
BI 207	Dynamics of Biological Processes	4	BI 106, CH 106 & CH 232	N	
Chemistry					
CH 142	Integrated Chemistry: Principles I	3	Corequisite CH 143	N	
CH 143	Integrated Chemistry: Principles Laboratory I	1	Corequisite CH 142	N	
CH 144	Integrated Chemistry: Principles II	3	Corequisite CH 145	N	
CH 145	Integrated Chemistry: Principles Laboratory II	1	Corequisite CH 144	N	
CH 242	Inorganic Chemistry (with Laboratory)	4	Co- or prerequisite CH 144	N	
Math					
MA 130	Calculus I	4		N	QM
or BI 305	Biostatistics	4	ESS 100 or BI 106	N	QS
or BI 305CW	Biostatistics	5		N	QS-CW
Physics					
PC 20X	Physics I & II with lab	8		N	

BIO POE: Upper Level requirements

A minimum of 18 credit hours of advanced biology coursework (Biology designated courses numbered in the 300's and 400's).

Evolution/Ecology	Cell and Molecular	Organismal	Biological Interactions
BI-300-301, Ecology [⊥]	BI-321, Ecological Genetics ^{*⊥}	BI-360-361, Vertebrate Zoology [⊥]	BI-310, Physiology [⊥]
BI-325-326, Plant Ecology ^{*⊥}	Genetic Analysis [*]	BI-350-351, Invertebrate Zoology ^{*⊥}	BI-305, Biostatistics [⊥]
BI-339, Organic Evolution	BI-331-332, Microbiology [⊥]	BI-367-368, Anatomy [⊥]	BI-450, Neurobiology
ESS-325, Conservation Biology	CH-301, BMB I	BI-327, Botany [⊥]	BI-432, Environmental Toxicology [*]
ESS-320, Environmental Monitoring	BI-316, BMB II	BI-399, Plant Diversity ^{*⊥}	BI-417, Reproductive Biology [*]
PY-402, Evolutionary Psychology [*]	CH-416, BMB III	BI-324, Ornithology [⊥] (summer, RFS)	
PY-401, Comparative Psychology [*]	BI-318, Developmental Biology	BI-323, Mammalogy [⊥] (summer, RFS)	
ESS-328, Limnology [*]	BI380, Biological Sciences Research Methods [⊥]	BI-370, Herpetology [⊥] (summer, RFS)	
BI-399, Animal Behavior ^{*⊥}	BI-399, Genetics Research Methods [⊥]		

* offered every other academic year

[⊥] indicates a laboratory course.

The following courses also qualify: CH 301: BMBI, CH 416: BMBIII, ESS 320: Environmental Monitoring, ESS 325: Conservation Biology, PY 401: Comparative Psychology, PY 402: Evolutionary Psychology CH 105, CH 106 and CH 232. (four semester sequence recommended; required for many graduate programs) **Either PC 200 and 201 or PC 202 and PC 203 each with PC 206 and PC 207. (8 credits)**

BIO POE: Possible progression

Freshman Year			
Fall Semester		Spring Semester	
Class	Credits	Class	Credits
CWS	4	BI 122	1
IA	1	CH 144 and CH145	3+1
BI 105	3	CH 116	1
BI 121	1	MA 130 or elective	3-4
CH 142 and CH143	3+1	Electives (including FISHN or CA or IC)	3-4
Electives (including FISHN or CA or IC)	3-4		
	13-17		13-15
Sophomore Year			
Fall Semester		Spring Semester	
Class	Credits	Class	Credits
BI 106	3	BI 207 with lab	4
CH 242 w Lab	4	Electives (including FISHN or CA or IC)	11-14
BI 289	1		
CH 118	1		
Electives (including FISHN or CA or IC)	6-8		
	15-17		15-18
Junior Year			
Fall Semester		Spring Semester	
Class	Credits	Class	Credits
PC 2XX (physics I)	3	Upper level Biology	3-4
PC 206	2	PC 2XX (physics II)	3
Upper level Biology	3-4	PC 207	1
Electives (including FISHN or CA or IC)	6-8	Electives (including FISHN or CA or IC)	8-10
	14-17		15-18
Senior Year			
Fall Semester		Spring Semester	
Class	Credits	Class	Credits
Upper level Biology	3-4	Upper level Biology	3-4
Upper level Biology	3-4	Upper level Biology	3-4
Electives (including FISHN or CA or IC)	9-11	Electives (including FISHN or CA or IC)	6-8

Graduating with Distinction

To graduate with distinction in the POE, seniors must complete an honors integrative experience, which is approved by two faculty members and presented in a public forum.

To achieve distinction in the POE, a student must:



NOTE: The Health Professions Program provides advising for career tracks and as such, does not offer POEs. However, students aspiring to careers in the health professions may attain distinction in POEs in their respective departments.

Other hints for JC biologists

Study help?

Go to instructor office hours.
Ask your instructor for a tutor.
Writing Center (Library)

Places to study

Student lounges
Empty labs and classrooms at night
Nook between vLB1058 and
vLB1060

Sophomore survival guide

- Take IC, CA and FISHN courses this year
- meet with advisors and submit your POE form
- consider summer internships (clinical, research, etc.)

Freshman survival guide

- form study groups for chemistry and biology
- meet with advisors
- bring writing drafts to the writing center for a second set of eyes
- if you plan to study abroad, plan early!

Junior survival guide

- meet with advisors and talk about career plans
- consider summer internships (clinical, research, etc.)

Resume

Get help from the Career Services Office.
Seek out your advisor for input on your resume draft

Senior survival guide

- Check your degree audit! Make sure you have all the requirements.
- Need a recommendation letter? Ask your professors well in advance, and be prepared to provide a resume and personal statement.

Secondary Emphasis in Biology

In order to claim a secondary emphasis in Biology, a student must successfully take courses in the following disciplines:

Biology

- Biology 105, Biological Diversity and Ecology
- BI 106, Functions of Cells and Organisms
- BI 207, Dynamics of Biological Processes
- BI 121, Biology Laboratories I
- BI 122, Biology Laboratories II

Chemistry

- CH 142, Integrated Chemistry I
- CH 143, Integrated Chemistry I Lab
- CH 144, Integrated Chemistry II
- CH 118, Integrated Chemistry II Lab
- CH 242: Inorganic Chemistry w Lab

Upper level courses of your choosing

- Two 300/400 level biology courses (must be from two different core areas; one course must have a laboratory component)



Advising in biology



Advising plays an important role in your education, and serves as a gateway to help you reach your careers and goals. Advisors have experiences and networks in many disciplines, and will offer you advice on classes and out-of-class experiences that help you meet your career goals.

Different advisors in the biology department have knowledge in graduate schools, medical schools, science jobs, science internships and more. Select an advisor that will best help you accomplish your goals.

It is important to know that advising is a collective responsibility between the student and advisor, and should involve active communication between parties. Students are expected and encouraged to make

The student should be active in his or her own education. They should help themselves by:

- Scheduled meetings with advisors in advance of important dates
- Come to meetings on time and prepared
- During registration meetings, come with a list of classes that the student would like to take

An advisor should help you in several ways:

- Help develop an academic career plan that aligns with student goals
- Provide students with options within their plan, and in instances when plans deviate
- Keep students informed about Juniata's resources
- Understand the importance of a liberal arts education

Advising plays an important role in helping students determine their academic interests and their academic strengths and weaknesses. Sound advice is essential as students elect courses, develop a Program of Emphasis, and explore options in careers and post-graduate education. Advising is also important in aiding in retention and increasing students' satisfaction in their college experiences.

Juniata “nuts and bolts”

You need 120 credits to graduate from Juniata. Within these credits, we hope you take a comprehensive investigation of your primary areas of interest, as well as an exploration into other perspectives to enrich your experiences.

Liberal Arts Distribution

Five liberal arts distributions areas

Fine Arts

International Studies

Social Sciences

Humanities

Natural Sciences



For your Juniata degree, you must successfully complete SIX credit hours of each distribution. In addition, a 300-level class (or a class that has a prerequisite) must be completed in three of these distributions – which is referred to as *in-depth*.

Other requirements

In addition to content knowledge, part of your experience at Juniata is to develop the skills to analyze and communicate knowledge. The following skill areas help you do this.

Communication Skills

12 credit hours of communication skills. 6 must be speech based (CS) and 6 must be writing based (CW). One CW class must be in your POE (in Biology, you are required to take Freshman Seminar, which fulfills this requirement).

Quantitative/Analytical Skills

Complete a course which deals explicitly with both statistical and mathematical skills (Q), or complete one statistical (QS) and one mathematical course (QM).

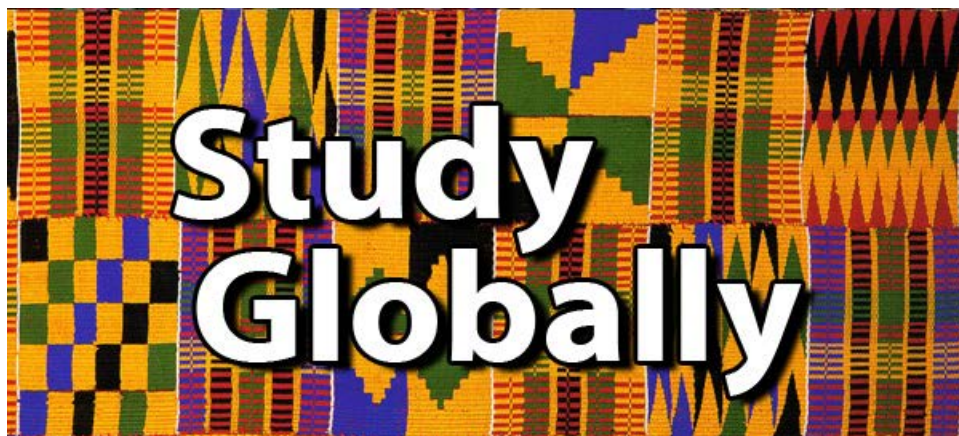
Interdisciplinary Colloquia (IC)

One course is required. IC courses help you consider the relationships between theory and practice in different disciplines.

Cultural Analysis (CA)

One course is required. CA courses help you consider human culture.

Study Abroad



There are many compelling reasons for why a biology student should study abroad. You will *never* get the chance to have this kind of opportunity again, so if you have an interest in experiencing life in a different country don't pass it up! Once you leave Juniata and begin graduate school or a job you will be consumed with preparing for or working in your profession. Even if you eventually serve as a volunteer overseas through your community or your profession, it will only be for a short duration and cannot compare with the experience you will obtain through study abroad. And those who become professors will typically have to wait at least seven years after being hired to have the opportunity to take a sabbatical in the U.S. or abroad.

Our society is very multicultural. It will benefit you to learn about another country from "the inside", as well as to experience what it feels like to be "on the outside". You will undoubtedly gain a level of understanding and empathy that will benefit your interactions with colleagues and students from other cultures. The experience will also help you learn how to survive and thrive with uncertainty, which is a critical life skill. In addition, study abroad provides the opportunity to become fluent in a foreign language, which will enhance your ability to function as a global citizen.

And finally, study abroad provides an unparalleled opportunity for self-reflection that will help you make informed decisions about your future. Many students have discovered things about themselves and or found new interests that have had positive, lifelong effects.

Application Deadlines are normally in December, for travel the following school year.

For more information, you can contact Juniata's **Center for International Education**:
<http://www.juniata.edu/departments/international/index.html>

Guidelines for a POE in Marine Biology

All the requirements of the Biology POE. A minimum of 12 credits of upper level marine biology coursework must be taken and may count towards upper level Biology distribution requirements. 3 Credits of the 12 may be research in marine biology. Transfer equivalencies will be worked out on an individual basis.

Guidelines for a Secondary emphasis in Marine Biology

All the requirements of the Biology Secondary Emphasis. In addition, the two upper level biology classes required of the secondary emphasis must be marine biology classes. Transfer equivalencies will be worked out on an individual basis.

Joint Juniata/Oregon Marine Program

Juniata College has established a semester-long cooperative program with the University of Oregon's Marine Biology (OIMB) research station during which students enroll for 12 to 15 hours of credit in marine biology. The participating student also may have research options. Following a strongly competitive application process, this important opportunity will be available to a highly motivated student interested in a career in marine or aquatic science. Students apply in their sophomore or junior year through Dr. Vince Buonaccorsi, Professor of biology. A year of biology, chemistry, and associated math is required. Additional fees may apply. Links to current classes offered and general information about the research station may be found at <http://www.uoregon.edu/~oimb/>. Qualifying credits earned through this program count as upper level Juniata Biology credits, furthering progress towards a Juniata degree.

This is an outline of the process (in this approximate order):

- Apply to Prof. Buonaccorsi to see if you qualify (March if applying the following fall)
- Pick classes at UO, considering effects on POE and transfer policy
- Discuss with Financial Aid/Bursar
- Statement of intent to Juniata registrar (see the template letter on the P-drive)
- Apply to UO
- Billing procedure: the student gets a bill from the host program, student needs to forward the bill to the Juniata Accounting for processing.

Raystown Field Station

<http://www.juniata.edu/services/station/>

The Raystown Field Station is located on Raystown Lake in Central Pennsylvania. It was established by Juniata College and the U.S. Army Corps of Engineers in 1974 to provide special opportunities for environmental research and education. The 365-acre reserve lies in the Valley and Ridge province of central Pennsylvania and offers visitors access to the various aquatic and terrestrial ecosystems of this unique region.

At the Raystown Field Station, Juniata College students can take classes, do research, and even spend an entire semester experience there.



Faculty

Jill B. Keeney

Professor of Biology
Department Chair, David K. Goodman '74 Endowed
Chair in Biology
Courses taught: Advanced Genetics, Biochemistry &
Molecular Biology
Research: bacterial and human genetics, gene
transposition, orphan genes
Office location: vLB1074

Randy L. Bennett

Professor of Biology
Courses taught: Comparative Anatomy, Cancer Cell Biology
Research: Morphological evolution, animal development
Office location: vLB1048

Vincent P. Buonaccorsi

Professor of Biology
Courses taught: Biostatistics, Genetic Analysis
Research: Population genetics and genomics, gene evolution, aging
Office location: vLB1050

Jason Chan

Assistant Professor of Biology
Courses taught: Physiology, Microscopy
Research: Cell biology of aging, neurobiology, stress, host-microbiota interactions
Office location: vLB1078

Chris Grant

Assistant Research Professor
Courses taught: Ecology
Research: Environmental toxicology, freshwater aquatic ecosystems, mercury toxicity
Office location: vLB1044

Douglas S. Glazier

Professor of Biology
Courses taught: Ecology, Organic Evolution, Mammalogy
Research: Functional biology and life-history evolution of crustaceans and mammals, ecology
of the pace of life and its scaling with body size, biology of springs, macroecology
Office location: BAC B313



Von Liebig Science Center

Jay Hosler

Professor of Biology

Courses taught: Animal Behavior, Neurobiology, Organic Evolution, Comics and Culture

Research: Science communication, animal behavior

Office location: vLB1082

Debra A. Kirchhof-Glazier

Professor of Biology

Courses taught: Human Biology, Nutrition, Rural Health Care Issues, Rural Health Rotations

Office location: BAC B303

Regina Lamendella

Assistant Professor of Biology

Courses taught: Microbiology, Dynamics of Biological Processes

Research: Microbial communities, Gastrointestinal microbiota, bioinformatics

Office location: vLB1076

Elizabeth Mansberger

Assistant Professor of Biology

Courses taught: Microbiology, Cell Biology

Office location: vLB1056

John M. Matter

Associate Professor of Biology

Courses taught: Vertebrate Zoology,
Reproductive Biology

Research: Vertebrate reproductive biology and endocrinology

Office location: BAC B229



Brumbaugh Academic Center

Norris Muth

Associate Professor of Biology

Courses taught: Plant Diversity, Botany

Research: Plant biology, Phenotypic plasticity in biological invasions

Office location: vLB1054

Staff

Susan Pierotti

Science Secretary

Office location: vLB Front desk

Christine Walls

Science technician

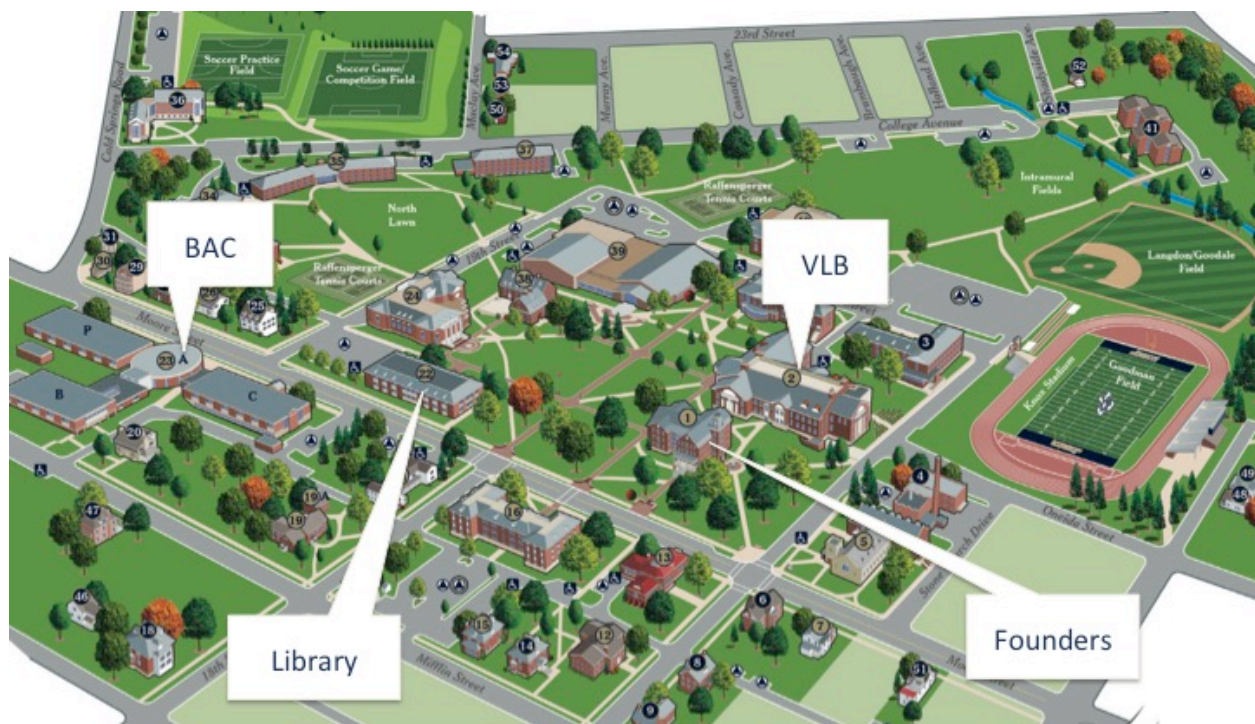
Office location: vLB1086

Susan LaVere

Faculty Secretary

Office location: BAC B200A

Map of Juniata



VLB – von Liebig Center for Science – Faculty Offices, Neff Lecture Hall, Biology Labs, Student lounges and study areas

BAC – Brumbaugh Academic Center – Faculty Offices, Lecture halls

Founders – Academic offices (Registrar, Academic Support)

Library – Place of learning!

Research in biology

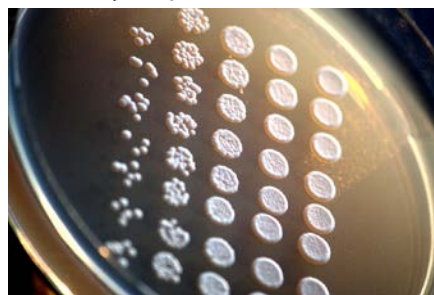
At Juniata, you have the opportunity to work with professors and do cutting-edge research in fields of animal behavior, cell biology, ecology, environmental science, genetics, microbiology, and neuroscience amongst others. The faculty are always looking for committed and curious students who want to contribute to scientific inquiry, research and new discoveries. Undergraduate research at Juniata is a great opportunity to learn Biology and learn what Biologists do. Qualified students may get an opportunity to attend local and national conferences, work during a paid summer research immersion experience at Juniata, apply for external summer research internships, and publish science papers!!

Tips for research getting involved in research.

- Let your advisor know from day 1 that you are interested in doing research at Juniata, and especially if you have a career interest in research.
- Do as well as you can in your introductory classes. Outstanding academic performance will be noticed by faculty.
- Take BI 380 (Biological Science Research Methods) as early as possible.
- Sign up for the Genomics Certificate. This will help put you on our radar screen for research.
- Seek out research opportunities (BI 489) by talking to faculty.
- Join Juniata's research LinkedIn page.

BI 380 (Biological Science Research Methods)

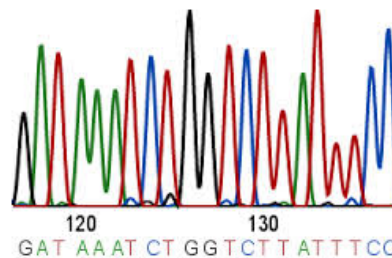
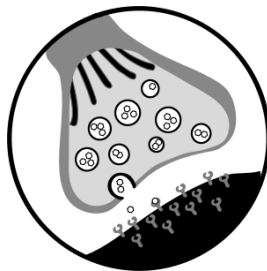
Biological science research methods is both an excellent introduction to what research is like, and a stepping stone for further research. The class is taught by a variety of professors in the Biology Department and is tailored to their research interests. The class involves intense skills training and pursuit of a real research questions, but with your input in design. Current sections include those taught by Drs. Keeney (molecular biology and genomics), Lamendella (molecular microbial ecology), Buonaccorsi (ecological and evolutionary genomics), Chan (physiology and neurobiology) and Grant and Muth (ecology and field methods sections). It can also be part of the genomics certificate, both which vary by professor. Pre-requisites may also vary.



BI 489 (Biology Research, by permission of instructor)

Most BI489 research is performed by students aiming for advanced graduate degrees. Most research is grant funded, very challenging and very serious. One should join a lab with the intent of learning techniques to pursue questions, not with the intent to build your resume. If you are struggling in your Biology POE classes (more than one C in the major), you are probably not ready yet for BI489. Successful research students are capable of mastering both knowledge and skills in an independent setting, and must be mature and conscientious learners. Most professors require that when you sign up for research for at least 3 credits per

semester, which means 12-15 hours of commitment per week. Research should be your main preoccupation other than your classes. Look at the Biology faculty web pages (<http://www.juniata.edu/departments/biology/faculty.html>) to find out who may be doing research of interest to you. Students are expected to show evidence of an ability to problem-solve and to use creative, independent and well-reasoned thought, and professional behavior that involves a good attitude and use of sound judgment (e.g., an ability to persevere despite adverse challenges and to do so with mature composure). Faculty are looking for the type of research quality and completeness that could be published as part of a scientific manuscript, and presented at conferences via oral and poster presentations.



BI499 (Senior Thesis, by permission of instructor)

For students that have completed a significant body of independent research, senior thesis may be an option. This is a 3 credit class involving a formal write-up of the research, and presentation of the project for the biology department.

Here are some recent **peer-reviewed publications** co-authored by students:

- Grant CJ, Weimer AB, Marks NK, Perow ES, Oster JM, Brubaker KM, Trexler RV, Solomon CM, Lamendella R. *Marcellus and mercury: Assessing potential impacts of unconventional natural gas extraction on aquatic ecosystems in northwestern Pennsylvania*. J Environ Sci Health A Tox Hazard Subst Environ Eng. 2015 Apr 16;50(5):482-500.
- Glazier DS, Hirst AG, Atkinson D. *Shape shifting predicts ontogenetic changes in metabolic scaling in diverse aquatic invertebrates*. Proc Biol Sci. 2015 Mar 7;282(1802).
- Trexler R, Solomon C, Brislawn CJ, Wright JR, Rosenberger A, McClure EE, Grube AM, Peterson MP, Keddache M, Mason OU, Hazen TC, Grant CJ, Lamendella R. *Assessing impacts of unconventional natural gas extraction on microbial communities in headwater stream ecosystems in Northwestern Pennsylvania*. Front Microbiol. 2014 Nov 4;5:522.
- Buonaccorsi VP, Narum SR, Karkoska KA, Gregory S, Deptola T, Weimer AB. *Characterization of a genomic divergence island between black-and-yellow and gopher Sebastes rockfishes*. Mol Ecol. 2011 Jun;20(12):2603-18.
- O'Donnell JP, Gehman M, Keeney JB. *Regulators of ribonucleotide reductase inhibit Ty1 mobility in saccharomyces cerevisiae*. Mob DNA. 2010 Nov 22;1(1):23.

Genomics Certificate

<http://www.juniata.edu/projects/hhmi/glireqs.html>

The genomics certificate is an opportunity for students to address both the science and the broader ethical, legal and social implications (ELSI) surrounding progress and discoveries in the field of genomics. This certificate is for all students with career interests in biological research and medicine, as well as students interested in public policy, public health, law, and business.

What is the certificate?

A certificate offers the possibility of a more cohesive general education experience oriented around a theme and taught by faculty who work together as a group on an ongoing basis and have common inter-departmental learning objectives and assessments. It consists of the completion of seven courses, and culminates a notation student's transcript.

What are the Learning objectives?

Here are some objectives of the genomics certification (full list available at the website):

- Describe the basic concepts and principles of genomics.
- Explain the scope of genomics from genes to society.
- Explain the importance of the place of genomics in the human effort to understand natural phenomena, including its history and social impact.
- Be able to make and justify ethical judgments about genomics research and its uses in medical practice and elsewhere.
- Use the skills and interdisciplinary perspectives of the liberal arts in understanding trends in genomics and communicating them to academic peers and others.
- Progress into a leadership role, working with experts and non-experts, with an awareness of the likely results of one's actions and an understanding of how results might differ in different settings and different cultures.

What classes do I need to take to complete the certificate?

Core requirements: complete 4 courses, one in each of the following areas:

- Ethical and social dimensions of genomics: **Genomics, Ethics and Society** (IC203)
- Basic molecular biology, genetics, and genomics: **Biology II** (BI106), **Human Biology** (BI190), or **Sensory Biology** (BI142).
- Statistics: **Biostatistics** (BI305), **Environmetrics** (ESS230), or **Introductory Probability and Statistics** (MA220)
- Informatics: **Information Discovery** (IM241), **BSRM** (BI380, currently offered by Keeney, Buonaccorsi, Lamendella), **Computer Science** (TBD), or **UNIX** (CS255)

Electives: complete 3 courses

- **Social History of Medicine History** (HS 211), **Medieval Medicine: Health and Disease in the Middle Ages History** (HS 399), **Doctors, Medicine and Russian Literature Russian** (RU 299), **Science and Human Values Philosophy** (PL 250), **Moral**

Judgment Psychology (PY3XX), and Leadership in the 21st Century AND Executive Leadership Business (EB 299 AND 199).

Get connected: Clubs and Social Media

You can find out about research, professional, and social networking opportunities by one of many joining groups at Juniata.

Biology Clubs

American Society for Biochemistry and Molecular Biology (ASBMB)

ASBMB is currently merged with ASM. They raise funds for their respective purposes and provide outlets for connections.

Club advisor: Dr. Daniel Dries

Club president: Vincent Knecht

American Society for Microbiology (ASM)

ASM is an international organization of scientists studying viruses, bacteria, fungi, algae, and protozoa as they relate to human health and the environment. Students that are members of ASM discuss current topics, visit local wastewater sites, wineries, and attend local and national conferences.

Club advisor: Dr. Regina Lamendella

Club president:

Beta-Beta-Beta

Tri-Beta is a society for students dedicated to improving the understanding and appreciation of biological study and extending boundaries of human knowledge through scientific research. Events include Bio Bonanza.

Club advisor: Dr. John Matter

Club president: Jon Partsch

Health Occupations Students of America (HOSA)

HOSA provides students with opportunities to volunteer in many community and health related activities, and to attend talks in the current professionals, current medical news, and health profession applications. Events include Scott Grugan memorial run, relay for life, healthy Halloween, amongst others.

Club advisor: Dr. Amanda Siglin

Club president: Heather Waring

Social Media



Linked In (Juniata College Biology Department Student Research)

Facebook (Juniata Health Professions)



Careers

The career services office has valuable information on internships, career planning, and job opportunities in biology. Visit their office in Ellis Hall or contact Darwin V. Kysor, Director of Career Services at kysord@juniata.edu

Stay on Target the Next Four Years

Freshman Year - Increase Self-Awareness

- Identify interests, values and skills by using FOCUS
- Meet with a Career Counselor and/or take NDSS 100 Career Planning
- Develop a professional resume and upload it to JuniataJobs.com
- Attend Juniata Career Day and career workshops throughout the year
- Test your interests through student organizations, volunteer work and a
- Find summer jobs and internships

Sophomore Year - Explore Relevant Work Experience

- Research specific careers and related qualifications
- Become active in student organizations relevant to your POE; consider a leadership position
- Update your resume on JuniataJobs and attend Juniata Career Day and career workshops
- Set Social Networking sites to “private” and maintain professional behavior
- Attend events with Juniata alumni to build your network; create a profile on Juniata Connect
- Get a job or internship related to your field of interest

Junior Year - Prepare for the Professional World

- Make employment/graduate school choices
- Update resume on JuniataJobs and participate in Career Workshops
- Network at Career Fairs: Juniata Career Day, WestPACS, CPEC
- Build a professional wardrobe and attend the Etiquette Dinner
- Simulate a Mock Interview
- Get an internship related to your field of study

Senior Year - Implement Career Choices

- Update resume on JuniataJobs and secure quality references
- Meet with a Career Counselor for your “Senior Meeting”; consider registering for NDSS 205—21st Century Career Search
- Create a LinkedIn Profile and network with professionals for job leads/grad school information
- Network at Career Fairs: Juniata Career Day, WestPACS, CPEC
- Apply to targeted employers/graduate schools: Follow-Up

What Can You Do With a POE in Biology?

With a Bachelor's Degree, get jobs in...

- animal technician
- bioanalyst
- bioinformatics
- food technologist
- laboratory technician
- technical writer

Or, get a Graduate Degree and explore the vast possibilities for biologists **Degrees**

- Botany
- Computational Biology
- Genetics
- Ecology
- Entomology
- Microbiology
- Molecular Biology
- Neuroscience
- Physiology
- Public health
- Systems Biology

And more...

Possible Employers:

- agricultural chemical companies
- biological book/journal publishers
- biological testing laboratories
- business and industry
- colleges/universities
- consulting engineering firms
- medical corporations
- pharmaceutical manufacturers
- education
- state/federal government

Health Professions Career Tracks

<http://www.juniata.edu/departments/healthprofessions/>

At Juniata, we have partnerships and knowledge of professional programs in the health professions. Our “tracks” help you take all the classes you need for particular programs, while giving you the flexibility to explore your liberal arts degree. Here are some of our tracks.

- Pre-Art Therapy
- Pre-Audiology
- Pre-Biotechnology
- Pre-Chiropractic
- Pre-Cytotechnology
- Pre-Dentistry
- Pre-Genetic Counseling
- Pre-Health Administration
- Health Communication
- Pre-Medical Social Work With a Focus on Medicine/Behavioral Health
- Pre-Medical Technology
- Pre-Medicine
- Pre-Naturopathic Medicine
- Pre-Nursing
- Pre-Occupational Therapy
- Pre-Optometry
- Pre-Pharmacy
- Pre-Physical Therapy
- Pre-Physician Assistant
- Pre-Podiatric Medicine
- Pre-Public Health
- Pre-Radiologic Sciences
- Pre-Veterinary Medicine

If you are interested in a health professions track at Juniata, contact Dr. Amanda Siglin (siglina@juniata.edu), Director of Health Professions, for more information.

