$1000 scholarship
Registration info
Declaring Biology as a major
New and improved courses for the upcoming term
Winterim and Summer 2018 courses
Health Professions
Work study
Teaching assistantships – Earn a credit and beef up your résumé
Dr. Brayton Hill: Profile of a recent Bio Grad
WISER Institute News
Revision to the Environmental Science Minor
Internships
Research with Profs
B.S. checklist
B.A. checklist
Bio. specialization checklist

BOB CERWONKA MEMORIAL SCHOLARSHIP

The Biology Department at SUNY Potsdam invites all Biology Majors to apply for the Bob Cerwonka Memorial Scholarship. This scholarship was made possible from a generous donation from department alumnus Mr. Robert E. Wagner '75. Dr. Cerwonka, a former faculty member in the department, was a Limnologist and Ecologist and also founder of our Lambda Xi Chapter of the Beta Beta Beta Biological Honors Society.

The successful candidate will:
1. Be a student who has declared Biology as their major;
2. Be in good academic standing at SUNY Potsdam, maintaining a minimum of a 2.5 GPA.
3. Preference shall be given to students that demonstrate an interest and appreciation of nature and the environment.
4. The applicant will be required to submit an essay that incorporates their understanding of ecology and natural history with their goals for a career in the life sciences.

The successful applicant will receive a $1,000 award. Students can apply for this scholarship multiple times. To apply, submit a typed essay of between 250 and 500 words to Dr. Jan Trybula by December 1st.
REGISTRATION

Advising begins October 16. The spring schedule will be available online this day
Registration begins:
- Seniors – November 9
- Juniors – November 113
- Sophomores – November 14
- Freshmen – November 16-17

Students may adjust their schedules on BearPAWS until midnight, Sunday, Jan. 21st 2018, which is the day before classes begin and before the week of Add/Drop.

Registration instructions can be found at this link:
http://www.potsdam.edu/offices/registrar/registration/index.cfm

Students should consult with their advisor to make sure that they have completed the appropriate prerequisites and cognates before choosing electives. Some course descriptions and B.S. and B.A. checklists are included in this newsletter.

DECLARING BIOLOGY AS YOUR MAJOR OR MINOR

Students are strongly encouraged to declare their biology major as early as possible.

Declaring your major or minor early will help you obtain a biology faculty advisor and help you select the best courses toward your degree. It is our wish to match students with advisors with shared interests within life sciences. To declare biology as your major or minor, see Marta Whalen, the Department Secretary (Stowell 207) or Dr. Jan Trybula, the Department Chair; Stowell 205A). Just fill out one form. The entire process takes less than three-minutes, but it can save you a semester or more by insuring that you receive an advisor who understands our program.

Madlyn Wilson holds a barn owl at raptor specialist Mark Manske’s bird facility. Maddie was a bio major…the owl is undeclared … (Photo: G. Johnson)

Above: Visiting an oyster farm on our Cape Cod trip – another cool thing about being a bio major! (Photo: G. Johnson)
NEW AND IMPROVED COURSES

BIOL 483 – Current Topics – Agroecology - SI

Ray Bowdish
Tuesdays 4:00 – 6:30

Prerequisites: Junior standing
Agroecology is the study of ecological processes applied to agricultural production systems. World food crises and ecological degradation are linked to current industrial agricultural systems. In this course, students will investigate the current literature and share information about global research and development initiatives that focus on finding, creating and implementing agricultural systems that reduce ecological impacts and provide more sustainable food production.

BIOL 483 – Current Topics – Socially Deviant Behaviors in Nature - SI

Dr. Plague
Wednesdays 2:00 – 4:30

All human societies have laws against socially deviant behaviors, like cheating, stealing, and murder. However, humans are not the only species that exhibit such behaviors. In this Speaking Intensive course, we will take an evolutionary approach to explore the breadth of socially deviant behaviors in nature, which may help shed light on why these behaviors persist in human societies.

Male lions often kill the young cubs after taking over a new pride.

BIOL 395 – Issues in Health Care

Dr. Ewy
MF 1200PM–1250PM; 01/23/17–03/20/17

This is a one credit, eight-week course where you will learn about various issues facing health care providers and prepare you for your medical, PA, Veterinary, Dental, and whatever else school interview. We will cover such issues as Physician-assisted suicide, Health Care systems around the world, the Affordable Care Act, and government-financed health programs. Towards the end of the course, you will be both interviewed and interview others to prepare you for your professional program interview. If you are not interested in gaining admission to a Health Care Professional Program, this course is not for you. See Prof Ewy for details.
**BIOL 385 – Guided Biology Research – 3 credits**

*Dr. Romey*

Have you been muttering for the last few years about wanting to get some experience doing research? Many graduate programs want to see this. Have you muttered that you wished there was a course that focused on the application of biological statistics, rather than the formulae? Well, mutter no more! We’ve heard you and designed a new course for those people: *Guided Biology Research*.

This is an upper-level biology course meant to help you develop your research skills. Students will meet together weekly to learn and practice how to: do statistics, read primary literature, write a research proposal, and give a presentation. There will be a focus during group sessions on how to use SPSS to explore data, make tables, and perform advanced statistics such as: ANOVA, ANCOVA, GLM, Multiple Regression, and Power Analysis. Early in the course, students will take a tour of the labs of participating faculty mentors doing research on: cell biology, physiology, behavior, and ecology. Once students have identified, and been accepted by, a faculty mentor they will develop a project and work in that person’s lab for about four hours a week as well as participating in the weekly interdisciplinary group. You don’t have to have a particular research project in mind when you sign up for BIOL 385, we’ll help you figure that out.

*Wednesday evenings 5-8pm plus individually arranged lab times. Prerequisites: Ecology (BIOL 300) and an overall GPA > 3.0*

**BIOL 322 – Introduction to Genomics**

*Dr. Cleary*

Mondays 4:00-6:30, Lab Wednesday 6:00-8:30 (Tom Yugartis) Prerequisite: BIO311

Genomics is an exciting emerging field, which has the potential to change our understanding of fundamental principles of biology. This course focuses on the application of large genetic datasets to biological problems and frontiers in biological research, including sequence alignment and search methods, gene prediction, building phylogenetic trees, transcriptomics, and genetic diseases in humans. The lab is required, and offers a unique opportunity to be part of a large genome annotation project currently underway.
BIOL 440 – Comparative Animal Physiology

Dr. S. Sirsat

Lecture: TuTh 11:00 – 12:15, Lab: Tuesdays 2:00 – 4:50  Prerequisites: BIOL 311 & CHEM 341

“For such a large number of problems there will be some animal of choice, or a few such animals, on which it can be most conveniently studied.” –August Krogh

Comparative Animal Physiology will explore how animals function - how they breathe, whether it be in water or in air; how they circulate their blood and how this facilitates the transport of respiratory gases, heat, nutrients, waste products, etc.; how they exchange energy with their environment and how this affects their body temperature; how they excrete; and how these phenomena are coordinated. As a comparative course, the topics will not be limited to humans, mammals, or even vertebrates. For example, we will explore how insects, fish and birds breathe, how some frogs survive freezing, and how an alligator heart is similar in function to the heart of a neonatal mammal. In short, we will be comparing structures and functions in a variety of animals to arrive at a better understanding of how animals have adapted to live and work in the diversity of environments found on Earth.

The required laboratory component will serve as an opportunity continuing lecture discussions and for hands on learning with conduction of experiments utilizing a variety of species where students will have the opportunities to learn how metabolic rates are measured, temperature affects physiological processes, nerves fire and muscles contract, and much more from specimens ranging across numerous classes.
**BIOL 415 – Virology**  
*Dr. Trybula*

MWF 1:00-1:50  Pre-requisites: BIOL 151/152 and Junior-level standing

Viruses can range from relatively benign like the common cold virus to very deadly indeed. Currently, hidden amongst the political headlines is information about West Nile Virus, Influenza, and others.

Since it was first detected in the US in 1999, WNV has killed more than 2000 people. This year, more than 20 states have reported nearly 50 deaths and also hundreds of neuroinvasive cases that lead to complications such as meningitis, encephalitis, and paralysis. Fears are that the terrible rains and floods around the Gulf Coast from the hurricanes may lead to more cases of this and other mosquito-borne viruses.

Influenza virus in the Southern hemisphere is more severe this year than anticipated, especially in Australia. This is potentially a harbinger of a bad flu season here in the Northern hemisphere this winter.

This course will help you understand the biology of viruses, their classification, their reproduction, their use as tools in molecular biology, antiviral medications, and more.

**BIOL 480 – Advanced Topics in Biology – Advanced Topics in Genomics**  
*Dr. Plague*  
Fridays 4:00 – 6:30 pm

Students in this class will collaborate on one or more novel bioinformatics projects investigating the molecular evolution of parasitic genes. We will go through the entire scientific process, from generating the questions to disseminating the results, and everything in between. Our goal is to have a manuscript at the end of the semester that we will eventually submit for publication, with all students as co-authors. This class would be ideal for anyone considering graduate school. Interested student’s should contact Dr. Plague ([plaguegr@potsdam.edu](mailto:plaguegr@potsdam.edu)). (Enrollment is by permission of instructor only.)
**BIOL 319 - Evolutionary Biology**  
*Dr. Cleary*

Tuesday and Thursday 11:00-12:15

“Nothing in biology makes sense except in the light of evolution” – T. Dobhanzky

A strong understanding of how evolution works is a critical tool for all biologists. This course will cover current topics in evolutionary biology, starting with the historical foundations of evolutionary thought, and ranging up to recent advances in coevolution, evo-devo, and genome evolution. We will learn how life on earth began, how species form and are defined, how sexual selection works, and explore the fossil record, the evolution of sociality, and human evolution. You will wake up every Tuesday and Thursday with an extra spring in your step, knowing that today you get to unravel the mysteries of life just a little bit more…

**BIOL 303 – Plant Physiology**  
*Dr. Ewy*

Lecture 1:00-1:50 MWF, Lab 2:00-4:50 M

Plants are dynamic organisms that can move water up 100 meters with no moving parts and no input of energy. We will cover these and other processes unique to plants in both lecture and lab. Experimental design will be stressed as students will design and carry out their own experiments on various plant physiology topics for half the lab exercises. Prerequisites: BIOL 151 or 125, and 152. General Chemistry highly recommended. Fulfills Physiology component for both BA and BS degrees.

**INTD 395 – New Frontiers in Bioethics**

MWF 11:00 – 12:00

Need additional upper division credit and perhaps a PI Gen Ed? "New Frontiers in Bioethics will be team taught by Prof Timothy Murphy of the Philosophy department and Prof Robert Ewy of the Biology department. This is a 3-credit course where will discuss both how you can modify human embryos and whether or not we should. We will cover many topics including genetic modification, how are we should experiment on animals, and how far this technology should be allowed to progress. If you are unencumbered by the ethical dilemmas presented by the advances in biotechnology, you should consider this course.
BIOL 355 – Conservation Biology – 3 Credits

Dr. Johnson
MWF 900AM–950AM STW–HL0103

Conservation biology is relatively new as an intellectual endeavor in biology. The central goal of this science is to maintain the planet’s biological diversity. It attempts to apply scientific principles to understanding and solving the problems facing most of the Earth’s ecosystems and species. It is both derived from and nested within such areas of biological science as ecology, wildlife and fisheries management, zoology and botany and draws heavily on expertise from physiologists, microbiologists, molecular biologists and population geneticists. It contains elements of many other disciplines including economics, political science, biogeochemistry, public health law, veterinary science, sociology and environmental engineering. Indeed, the question may be what is not within the domain of Conservation Biology?

Releasing spruce grouse captured in Ontario into the Adirondacks to augment bolster (and increase the genetic diversity of) NY populations of this endangered species. Photo: Jason Hunter.

ENVR 485/BIO 485 - Spring 2018 Research Course option

Dr. Rogers

Are you interested in conservation and deforestation? How about working in Africa, specifically Central Africa. Dr. Jessica Rogers is looking at forest change using remote sensing and GIS. Knowing some GIS or having taken GEO 340 is a plus, but it is not a requirement. You can help look at new change in the forests in Central Africa and help drive policy decisions and forest inventory for developing countries. Contact Dr. Rogers and register for ENVR 485/BIO 48
This course is a natural extension to BIOL 330, the Natural History of the Lower Vertebrates. While BIOL 330 is not a prerequisite, it is a useful precursor because many of the concepts in 330 are utilized again in this course. This course will devote itself to birds and mammals, including overviews of their (and our!) evolution, systematics, anatomy, physiology, ecology, and behavior. In addition to the “facts” about birds and mammals, you will be introduced to important ideas—especially in the areas of evolutionary biology, systematics, morphology, and ecology—that form the basis of our conceptual understanding of these animal groups. The general approach will be phylogenetic, tracing each group from its origins, discussing the major changes associated with its evolution, and reviewing selected elements of its current diversity and biology. Several field trips in spring are part of the course. As part of this course, I am planning on a weekend trip to Cape Cod late in the semester, which will include a Whale Watch for marine mammals and seabirds.
NEW FACES IN THE BIOLOGY DEPARTMENT!

Introducing the Other Dr. Sirsat

Despite our shared names and titles, I have quite a different background than my wife and other SUNY Potsdam biology professor, Dr. Sarah Sirsat. I was born and raised in Maharashtra, India; second-most populous state in India and home to Bollywood, Mumbai, much of the Western Ghat mountain range, the Deccan plateau, and the world heritage sites of Ajanta and Ellora Caves. I am a graduated medical student from the city of Aurangabad, where I received a Bachelor of Medicine, Bachelor of Surgery (equivalent to the Doctor of Medicine degree conferred upon medical graduates in the United States). As part of my tenure in medical school, I served as a rural medical officer and clinical research investigator. In order to continue research interests in the medical field, I decided to pursue a doctoral degree in the United States. I joined Dr. Edward Dzialowski’s laboratory at the University of North Texas and have recently completed my PhD with an emphasis in cardiovascular system maturation and endocrine regulation. During my PhD, I worked on a variety of projects, including developing a means of measuring ventilatory chemosensitivity, role of thyroid hormones in hatching, growth and ontogeny of endothermy in newly hatched birds and reptiles. My wife and I relocated to the north country last year when she accepted a faculty position in the SUNY Potsdam Biology department. So far I have enjoyed very much the hiking and fishing, especially ice-fishing.

I am currently preparing for the USMLE and serving as an adjunct for the SUNY Potsdam Biology department. I hope to pursue a medical residency in the field of internal medicine, with special emphasis on the cardiovascular and endocrine systems.
Winterim 2018

TRAVEL TO BELIZE

BIOL 352
TROPICAL ECOLOGY
& CONSERVATION

This course involves a trip (Dec 30, 2017-Jan. 12, 2018) to a variety of field sites across Belize, including a Mayan Ruin, a remote Biological Field Station in the Maya Mountain rainforests and several days on a Caribbean island.

If you are interested in this course, you will need to register by early September and attend several meetings prior to the official start of Winterim.

Check out this website for information about the BFREE Bio Station: http://www.bfreebz.org/

Need more info?

See Dr. Johnson in 231 Timerman
AND send him an email:
johnsong@potsdam.edu
SUMMER TRAVEL COURSES

Marine Biology for Summer 2018

Join the adventure! Several SUNY Potsdam students have been taking biology elective credits at our affiliate institution, the Gulf Coast Research Laboratory (GCRL) in Ocean Springs Mississippi as part of our Marine Biology Program. Courses include Marine Biology, Marine Mammals, Shark Biology, Ichthyology, and a variety of other life science courses with a marine focus. There are also research options available. Classes fill fast so please be attentive to opening dates if interested. For complete details, please visit the GCRL website (http://www.usm.edu/gcrl/) and under “Academics” click on “GCRL Summer Field Program.” Interested students should also contact our GCRL advisor, Dr. Conley.

Marine Biology class of 2014 on Santa Rosa Island, Pensacola Florida; including Potsdam students Ceira Dawson and Matt Nobles.
SUNY Potsdam will be offering a travel program to Kenya from May 24 – June 2018. You’ll get to take 2 courses, simultaneously, for 6 credits: BIO 352 Tropical Biology and Conservation (BIO UD credit, ENVR science elective) and ENVR 195: Environmental Studies in Kenya (XC and ENVR elective). Both courses will travel to 4 different sites in Kenya looking at wildlife, national parks, management and conservation practices and cultural exchange. The program fee covers all expenses from leaving the US until your return.
Students in the six Biological Concepts (BIOL125) lab sections recently participated in a fieldtrip to Lehman Park, where they sampled aquatic organisms from the Raquette River and learned about organisms that live in our region. Some of the organisms viewed were praying mantis, dragonfly nymph, giant water bug, lichen, great blue heron, monarch butterfly, and a pileated woodpecker. This was the first time that many of these students visited this peaceful and interesting campus gem.

Nelson Torres, a senior Biology major and lab assistant, led the students in proper aquatic sampling techniques.
Health Professions

If you are interested in a health profession, enroll in the "Health Professions" Moodle course. You will find information on various careers, how to prepare for such a career, and what exam you may need to prepare for.

Preparing for MCATs or another exam that will test your Biology knowledge? The best way to really know Biology is to teach it! The Department is looking for TAs to help with Biology 152 recitation. This is an excellent way to review your Biology and help out the Intro class.

HPAC interviews will be done in late March or early April. Please have your letters of recommendation to Prof Ewy by mid-March. For more information, contact Prof Ewy.

WORK STUDY

If you are interested in and eligible for the federal work study program please see either Rachel Wallace (wallacrm@potsdam.edu, Ph 267-4814), or the department secretary, Marta Whalen (whalenmm@potsdam.edu, Ph 267-2276). Responsibilities include laboratory setup and cleanup, plant and animal care and a variety of secretarial work.

TEACHING ASSISTANTSHIPS

See the world from our side. Most professors are looking for motivated students to be teacher assistants for their courses. This is a great way to get some teaching experience and an opportunity to work more closely with one of your pros. This also counts as a 1 credit upper division bio course. Contact your Pros before the end of the semester if you are interested and see some possibilities below.

- 4 (four) TAs needed for Bio 311 labs (Genetics) - Contact Dr. Trybula

- Many TAs needed for BIOL 152 (General Biology II labs), BIOL 125 (Biological Concepts) and BIOL 100 (Principles of Biology)-- For all Contact Dr. Trybula

Teaching Assistant (TA) positions in General Biology 2 labs

If you are interested in becoming a Teaching As in the General Biology II labs (BIOL 152), please contact Dr. Trybula before the end of the fall semester. Basic requirements: 1) successful completion of Biology I lecture and lab courses (3.0 or better) and 2) a willingness to commit at least 2 hours of time outside your regularly scheduled lab section each week.

As a lab TA you will be helping to prepare and teach the General Biology II labs. This is a great way to reinforce you knowledge and to learn how things are done “behind the scenes” of lab. Upon successful completion of a TA position, students earn 1 credit and no monetary compensation.
Teaching Assistant Opportunities  The department has a number of teaching assistant positions available this coming spring. **Biology 100 needs four TAs,** Contact Dr. Ewy or Dr. Trybula if you are interested in being a TA for Biology 100 (the non-majors will appreciate your help). We are particularly interested in someone who can help set up the 4 two-hour sections of Biology 100 labs which meet on Thursdays. The Biology 100 lab can be set up anytime during the week, so you can easily fit it into your schedule. This is an excellent way to review your introductory Biology, learn some teaching techniques, have some fun, and earn 1 hour of credit.

TAs: I am looking for TAs for for **INTD 395.** I am looking for a TA who took Issues in Health Care last spring to be a TA for an interdisciplinary course "New Frontiers in Bioethics." This course will combine philosophy and biotechnology and look at some of the ethical dilemmas brought on by our advances in biotechnology. See **Prof Ewy** for more details.

**BIOL 311 – up to 4 Teaching Assistants for Genetics labs**
Dr. Trybula
Labs: Tuesday 9:00-11:50a.m., Tuesday 2:00-4:50p.m., Wednesday 2:00-4:50p.m.
Pre-requisite: BIOL 311 lab or permission of instructor

Teaching Assistants needed for three lab sections, one TA will be selected as the lead TA who coordinates the prep activities. Duties include lab prep, lab breakdown, and attending one of the lab sections to assist the instructor and students. It is preferred that TA applicants have prior experience working with chemicals (e.g. CHEM 105) and willingness to learn lab and chemical safety regulations.

"When you teach you gain much more understanding of the subject at hand."
**This is a quote from an anonymous Bio TA.**

Wild Sea Otters chilling out (Photo: Rob Ewy)
Profile of a Recent Bio Graduate: Dr. Brayton Hill

My name is Dr. Brayton Hill, DVM; and I have been a Veterinarian in Watertown, New York for 3 years. I grew up in the Thousand Islands and received my Bachelor of Science in Biology with a minor in Chemistry from the State University of New York - Potsdam from 2006 to 2010. While at SUNY Potsdam, I worked on several volunteer and research projects. Most of my time was spent with Dr. Glenn Johnson and the NYS DEC on projects including the research of threatened turtles and other amphibian and reptile species in Northern NY.

After graduation from SUNY Potsdam, I obtained my DVM (Doctor of Veterinary Medicine) from Ross University in St Kitts, in the West Indies from 2011 to 2015 and I finished my clinical training at Cornell University School of Veterinary Medicine. While studying at Ross, I participated in many volunteer and research projects. Much of my research time in St Kitts was spent working with the Saint Kitts Sea Turtle Monitoring Network. There I had the pleasure of assisting with several sea turtle rescue efforts on the island, completed nesting surveys of adult gravid female leatherback sea turtles, green sea turtles and hawksbill sea turtles and also helped with rehabilitation and release of hatchling sea turtles. In my third year at vet school, I had the fortune of becoming a published author in a professional peer reviewed journal, the Journal of Zoo and Wildlife Medicine. This article was based on the medical case of an injured sea turtle that was found floating in the Caribbean Sea. After physical examination and much diagnostic work up, the individual was found to have a cecum impaction, which was visible on radiograph.

During my fourth year of vet school, I was offered my first job as a veterinarian in a small animal general practice veterinary hospital in Watertown - New York. The clinic is called the North Country Animal Health Center and it is where I currently practice veterinary medicine. Here I see many species of pets and wildlife animals including dogs, cats, birds, small mammals, reptiles, amphibians and even some marsupials. My professional interests include zoo and wildlife/conservation medication, specifically working with turtles. I love surgery, endoscopy and diagnostic imaging. I currently live in the Thousand Islands region of New York with my wife, Leann and twin daughters, Elliana and Juliette. We share our home with 3 dogs, 2 cats and a backyard flock of 9 chickens.
Teaching local Kittitians the importance of sea turtle conservation, 2012.


Holding an Iguana patient for radiographs to determine if gravid, 2013.
Revision to Environmental Science Minor!!

Beginning Fall 2015, the Environmental Science Minor was revised in an effort to shift the focus of the Environmental Science Minor to the natural sciences in order to give students the knowledge and technical skills they need to get jobs in the environmental science sector. The number of credits is largely unchanged and the number of uncounted prerequisite courses has been greatly decreased. Most scientists who focus on environmental issues end up functioning primarily as either biologists (plants, animals, and ecosystems) or geologists (water, soil, and pollution); a minor that gives them interdisciplinary training will improve their marketability. Common tasks like wetland delineation can be done more effectively by a biologist if they have had a few classes on soil and water; geologists can do it more effectively if they have had formal coursework on ecology and plant biology. See it below!

Revised Environmental Science Minor (24 credits)

<table>
<thead>
<tr>
<th>Level</th>
<th>Course</th>
<th>Credits</th>
<th>Required for:</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required courses: 6 credits</td>
<td>ENVR 110: Introduction to Environmental Studies</td>
<td>3</td>
<td>all</td>
<td>none</td>
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<tr>
<td>Required courses: 3-4 credits for BIOL/GEOL majors, 7 credits for others</td>
<td>CHEM 301: Fundamentals of Environmental Science</td>
<td>3</td>
<td>All majors except GEOL and BIOL</td>
<td>one semester of college-level science</td>
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<tr>
<td></td>
<td>PHYS 325: Energy and the Environment</td>
<td>3</td>
<td>GEOL and BIOL majors</td>
<td>one semester of college-level science</td>
</tr>
<tr>
<td>Prerequisite courses: 3-4 credits for BIOL/GEOL majors, 7 credits for others</td>
<td>GEOL 101: Environmental Geology</td>
<td>3</td>
<td>non-GEOL majors</td>
<td>none</td>
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<tr>
<td></td>
<td>BIOL 152: General Biology II</td>
<td>4</td>
<td>non-BIOL majors</td>
<td>none</td>
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<tr>
<td>Advanced Courses: 14 credits for BIOL/GEOL majors, 11 credits for all others.</td>
<td>BIOL 300: Ecology + Lab</td>
<td>4</td>
<td>non-BIOL majors</td>
<td>BIOL 152</td>
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<tr>
<td></td>
<td>BIOL 312: Insect Ecology</td>
<td>4</td>
<td></td>
<td>BIOL 152</td>
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<tr>
<td></td>
<td>BIOL 326: Morphology of Higher Land Plants</td>
<td>3</td>
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<td>BIOL 152</td>
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<td></td>
<td>BIOL 330: Natural History of Lower Vertebrates</td>
<td>4</td>
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<td>BIOL 152</td>
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<tr>
<td></td>
<td>BIOL 331: Natural History of Higher Vertebrates</td>
<td>4</td>
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<td>BIOL 152</td>
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<td></td>
<td>BIOL 334: Biology of Woody Plants</td>
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<td>BIOL 152</td>
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<td></td>
<td>BIOL 355: Invertebrate Biology</td>
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<td>BIOL 152</td>
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<td></td>
<td>BIOL 402: Conservation Biology</td>
<td>3</td>
<td></td>
<td>BIOL 300 or permission of instructor</td>
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<tr>
<td></td>
<td>CHEM 311: Quantitative Analysis</td>
<td>4</td>
<td></td>
<td>CHEM 106</td>
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<td>GEOL 340: Geographic Information Systems</td>
<td>4</td>
<td></td>
<td>Sophomore standing</td>
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<td></td>
<td>GEOL 310: Hydrology and Hydrogeology</td>
<td>4</td>
<td>non-GEOL majors</td>
<td>100-level geology class + either CHEM 105 or MATH 125 or MATH 151 or STAT 100</td>
</tr>
<tr>
<td></td>
<td>GEOL 406: Geomorphology</td>
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<td></td>
<td>100-level geology class + junior standing</td>
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<tr>
<td></td>
<td>PHYS 330: Meteorology</td>
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<td></td>
<td></td>
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<td></td>
<td>CONS 314: Soil Mechanics (SUNY Canton)</td>
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<td></td>
<td>GEOL 101</td>
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<tr>
<td></td>
<td>CONS 386: Water Quality (SUNY Canton)</td>
<td>4</td>
<td></td>
<td>GEOL 310</td>
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</table>
**INTERNSHIPS**

**St. Lawrence Land Trust - University Student Internship**
The St. Lawrence Land Trust (SLLT) is looking for motivated interns interested in non-profits and community based environmental conservation during the fall and spring semester. The SLLT, a non-profit conservation organization based in Canton, NY is looking for 1-2 interns who are currently enrolled and attending a university. Interns will be overseen by the SLLT intern coordinator and a member of the board. Interns can either volunteer or arrange for course credit. Interns will be tasked with several goals and tasks can be divided between the interns or accomplished collaboratively, depending on expertise and availability:

1. Creating informational signage for Hart’s Falls, a property owned by the Land Trust on the Grasse River in the Town of Russell. Interns will research the property’s history and local use for informational displays.
2. Preparing the Land Trust’s materials for national accreditation. This will involve research into standards and practices and helping the Land Trust determine if all paperwork exists or needs to be created. Interns will work with the board to create any missing documents.
3. Work with our webmaster to create updated web pages for our existing web site. Training will be provided.

Details:
- Start date: 1/23/17
- Some outdoor work exploring SLLT related properties
- Must have access to a computer
- Course credit may be available, talk to your academic adviser about this specifically.
- Time commitment: 6-8 hours/week during the spring semester

If you are interested in this position, please send a brief cover letter and current resume to stlawlandtrust@stlawlandtrust.org as soon as possible. See Drs. Rogers or Johnson for details.

**WISER Center**

*Please consider a WISER Internship Opportunity or join the Current Topics in Agroecology course next spring.*

Look for update on WISER Center in Spring 2018 issue!
Biology Department Applied Learning Opportunities

Care and Handling of Display Animals in the Biology Department at SUNY Potsdam
- Help care for animals (amphibians, reptiles and fish) in the department
- Create learning materials to help others discover the animals in the department
- Report your work to the campus at the Learning and Research Fair

Wagner Institute for Sustainability and Agricultural Research (WISER) Internship, in the Biology Department at SUNY Potsdam
You get to:
- Manage the Healthy Plant Initiative (HPI) program
- Grow microgreens for PACES
- Help Develop our campus composting initiative
- Learn horticultural technique
- Practice Integrated Pest Management
- Report your achievements to the campus at the Learning and Research Fair

Biology Technician Internship Techniques in the Biology Department at SUNY Potsdam
You get to:
- Help create and maintain chemical inventory lists
- Learn to prepare lab materials for biology labs
- Develop skills in lab instrument care and maintenance
- Maintain the lab materials inventory
- Learn various lab protocols and skills for working in a biology research lab
- Get trained in chemical safety

Off Campus Internship Opportunity
Study Horticulture from Never Tire Farm
Each spring, Never Tire Farm (Lisbon, NY) seeks motivated students of junior status or higher, for a unique and valuable experience, working in a modern greenhouse operation. Students that qualify for the internship will be actively learning about all aspects of greenhouse production including: sowing, transplanting, fertilizing, watering and propagation of various annuals, perennials, vegetables and herbs. Interns learn about the business of growing plants and will be exposed to maintenance and labor issues facing modern growers. Qualifying interns should have experience as a WISER intern and be trained in Integrated Pest Management (IPM) techniques and participate in the Never Tire Farm's biological control program.
Notes from the field...

Our Ecology laboratory class (BIO300) has been out and about in the Adirondacks over the past few weeks, enjoying the warm fall weather. We have been learning how to assess the health of freshwater streams, how to identify zooplankton and phytoplankton in northern lakes, how to estimate tree diversity and coverage in hardwood forests, and most importantly, how to tell a leech from an innocent cranefly larvae. We have more exciting lab outings planned for the next few weeks!
RESEARCH WITH PROFS

Dr. Glenn Johnson – Conservation of Threatened Species
231 Timerman Hall, 267-2710, johnsong@potsdam.edu

I am participating in a relatively new turtle project that began in earnest last Fall, where students and I are surveying local streams for the presence of wood turtles, considered a Species of Greatest Conservation Need in New York. This project is regional in scope and is being pursued by conservation departments in most northeastern states. In the meantime, we are busy beginning surveys in streams and rivers throughout the region. Wood turtles are most readily found in Fall (late September – mid November) and again in late March to early May, when they are still active and moving about in clear streams that flow through woodlands and meadows. Between those dates in winter, they are hibernating in the stream banks and in beaver lodges, while in summer they spend most of their time on land, foraging for invertebrates they love to eat. Three students are participating this Fall and I am hopeful a similar number will be interested next Spring…so, if you like to muck about in wetlands and cruise up and down beautiful creeks and streams, please stop by and see me or email (johnsong@potsdam.edu).

A second, somewhat related project involves a region-wide survey for Blanding’s turtles, a Threatened Species over much of its range. This project is part of a multi-state State Wildlife Grant, is fully funded, and we will be cooperating with conservation biologists in Pennsylvania, Massachusetts, New Hampshire and Maine. Our portion involves conducting rapid assessments of Blanding’s turtle populations across the North Country, Saratoga and Dutchess Counties, establishing several long-term monitoring sites, creating artificial nest sites for this species and setting up a Turtle Crossing sign network within parts of New York. If interested in learning more, please contact Dr. Johnson.

Dr. Jan Trybula - Molecular Ecotox

I study molecular environmental toxicology. That is a fancy way of saying using molecular techniques of DNA or protein genetics to study how pollutants in the environment disrupt the genetics of various organisms. Of course, my species of interest are dragonflies, but I’m willing and able to work on just about anything. Currently we are looking at the genetic variation in populations of Drosophila fruit flies to act as models for some preliminary testing before we start toxicity exposures. The ultimate long-term goal is to find the gene variants that confer resistance or susceptibility to toxins in the environment.
Dr. Rob Snyder

Note: Dr. Snyder will be on sabbatical leave for the Spring of 2018

Interested in independent research? I’m willing to mentor undergraduate research in genomics / bioinformatics and phylogenetics, as well as, behavioral ecology. Don’t know what you want to do? Stop by my office when I return (307 Stowell).

Check out my website for news and information about the Snyder Lab http://www2.potsdam.edu/snyderrl/

Robert Ewy - Research experience on environmental effects on plants

I have a number of research projects ranging from sustainable energy (biofuels) to co-evolution of proteins. You can learn a number of different techniques, including molecular biology processes, insect identification, analysis of "non-traditional" data sets, protein isolation and identification, to data crunching. If you are at all interested in graduate school, research experience during your undergraduate education is becoming a must. But the most important point is that research is fun! I work with all levels of students, from first year students to seniors. The only requirements you need are curiosity and an appreciation of plants.

I am particularly looking for someone to make growth measurements this fall/next spring as the willows were harvested this winter and will quickly grow back. The willows are beginning their 10th year after planting. You can earn research credit via Biology 485 or an internship.
**Dr. Gordon Plague – Research Opportunities in the Plague Lab**

Transposable elements are the most abundant and most ubiquitous genes in nature. In my lab, we study the molecular evolution and ecology of transposable elements using both laboratory experiments and data mining/bioinformatics approaches. I’m looking for several motivated students to participate in this research. If you’re contemplating graduate school, this is a great way to gain hand-on research experience. Please contact me if you’re interested (plaguegr@potsdam.edu).

**Dr. Jessica Rogers - Purple Loosestrife Research Project**

Assistant Professor Dr. Jessica Rogers worked with two SUNY Potsdam student research interns, Robert Luckman ’18 and Matthew King ’18, over the summer to document infestations of invasive plant species in the St. Lawrence River Valley, using cloud-based data collection. Rogers teaches in SUNY Potsdam’s departments of biology and environmental studies. She and her students traveled to examine and record the presence of several types of invasive plant species in an area stretching from South Colton to Alexandria Bay, N.Y. Rogers’ research is funded in part by a grant from the St. Lawrence River Research and Education Fund. “Very little data is collected for St. Lawrence County, especially for invasive species. They normally stop at the Blue Line at the edge of the Adirondack Park, so there’s no information for our area. Our goal this year was just to map it, to know where these species are, so we can do something in the future,” Rogers said.

The research team is seeking to document the spread of purple loosestrife throughout wetlands in the region in particular. Additionally, they are also looking for two other invasive species, the common reed and wild parsnip. To be considered invasive, a species must be non-native to an area and have no predators, Rogers said. “Only a particular set of species of beetles eats the purple loosestrife, so it’s going to spread everywhere. And the problem with this spreading is that ultimately all of these cattails will be gone and you’ll have a field of purple loosestrife. So, you’ll get none of the migratory birds that use the wetlands, and you’ll end up with just purple loosestrife—which, while beautiful, is ecologically barren,” said Rogers.

“Ultimately, all the wetlands will get dried up by purple loosestrife. As a migratory bird issue, this is huge, because we’re such a stopover point from the northern range and the southern range of all the migratory species,” she added. Among the findings from the first year of the project was that there was a correlation between a higher number of invasive plant species in areas where the state and municipalities have mowed along roadsides.

Following the successful first year of the project, Rogers plans to move toward efforts to remove the purple loosestrife in the locations where it has been found, by introducing a beetle species that will attack the invasive plant. This research will continue during Summer 2018, and students are encouraged to reach out to Dr. Rogers (rogersje@potsdam.edu) to work on this research for credit during the Spring semester, or apply for an internship during the summer.
Giant Swallowtails, the largest North American butterfly, are appearing with increasing frequency in the North Country. The larvae, whose early instars mimic bird dropping, feed exclusively on plants in the citrus family Rutaceae. In our area, the only member of this family is the Prickly-Ash.

Photo by Charlotte Demers, from SUNY College of Environmental Science and Forestry's Adirondack Ecological Center. The photo was taken 18 September 2017 in Newcomb, Essex County, NY.

Photo: Ilene Klein. Great blue heron in the Los Penasquitos Lagoon at the northern edge of the city of San Diego.
## REQUIRED BIOLOGY COURSES
### (22 hours)

<table>
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<th>Title</th>
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## REQUIRED CHEMISTRY COURSES
### (12 hours)

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## REQUIRED PHYSICS COURSES
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## REQUIRED MATH COURSES
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## BIOLOGY ELECTIVES
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CHEM 342 (Organic Chemistry II) is highly recommended for careers in health sciences, molecular biology, or physiology. MATH 151 and 152 (Calculus I and II) are co-requisites for the University Physics sequence. No more than 4 cr of BIOL 475, 485, or biological internship may be used toward elective hours. * If you take both BIOL 300 lab and BIOL 311 lab, one will count toward your Biology elective hours. ** MATH 141 & 142, Integrated Calculus IA & IB, together count as equivalent to MATH 151, Calculus I Must have a 2.0/S or higher in all major courses, including cognates.
### Requirements for Graduation

**Biology (BA)**

<table>
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<th>Required Biology Courses: 22</th>
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### REQUIRED BIOLOGY COURSES
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### BIOLOGY ELECTIVES
(15 hours)

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No more than 4 cr of BIOL 475, 485, or biological internship may be used toward elective hours.

* If you take both BIOL 300 lab and BIOL 311 lab, one will count toward your Biology elective hours.

Must have a 2.0/S or higher in all major courses, including cognates.
BIOLOGY SPECIALIZATION REQUIREMENTS

Biology Required Courses (13 hrs)  Biology Electives (6 hrs)

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College requirements are 19 hours in the Specialization. All electives after the first year sequence must be 300 or higher.