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. Please note: You must be a matriculated student in the Fall following the award given in January to be eligible to receive the funds!!!

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 (see #4 above) of between 250 and 500 words to Dr. Glenn Johnson by December 1st 2022.

THIS ISSUE (The Northern Variable Pitohui Issue)  Spring 2022

- Up to $1000 scholarship (below); there was no recipient this past year
- Registration info
- Declaring Biology as a major
- Transitions in the Biology Department / Social Networks
- Potsdam Pathways
- New and improved courses for the Fall 2022!
- Health Professions
- Marine Biology for Summer 2022; Belize Winter 2022-2023
- WISER Center News
- Profile of a Biology Graduate: Dr. Jason Gokey
- Internships – Work Study
- Teaching assistantships – Earn a credit and beef up your résumé
- What to Do With a Biology Degree
- Environmental Science Major is officially here; see details inside!
- Research with Profs
- The Biology Department’s Herbarium
- Beta Beta Beta (TriBeta)
- B.S. checklist and B.A. checklist; Bio. specialization checklist

Comments or suggestions about the newsletter?
Contact Dr. Glenn Johnson, Newsletter Editor, in Timerman 231, x2710, johnsong@potsdam.edu
REGISTRATION

*Advising begins March 21.* The spring schedule will be available online this day

*Registration begins:*
- **Seniors** – April 13
- **Juniors** – April 14
- **Sophomores** – April 18
- **Freshmen** – April 19
- **Transfer Students** – April 25

Students may adjust their schedules on BearPAWS until midnight, Sunday, August 28th, 2022, 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](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. **View the Fall 2022 class schedule at:** [http://www.potsdam.edu/offices/registrar/schedules/classschedulebydept](http://www.potsdam.edu/offices/registrar/schedules/classschedulebydept)

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, go to [https://www.potsdam.edu/about/offices/registrar/majorminor-declaration](https://www.potsdam.edu/about/offices/registrar/majorminor-declaration) for directions, but we suggest you visit with your Academic Advisor or Dr. Glenn Johnson, the Department Chair (Timerman 231) first!. **To declare Environmental Science as a minor, see Dr. Glenn Johnson.**

Just fill out one form. The entire process takes less than three minutes, but it can save you a semester or more by ensuring that you receive an advisor who understands our program.

Right: A group of SUNY Potsdam students at the BFREE Biological station in southern Belize…

Left: Humpback whales bubble net feeding on our Cape Cod trip – another cool thing about being a bio major!

(Photo: Alex Matte) (Photo: Glenn Johnson)
TRANSITIONS – NEW DEVELOPMENTS IN THE BIOLOGY DEPARTMENT

Reminder: Biology 151 and 152 changes

Biology 151 and 152 will each be taught both semesters, a change we made beginning back in Fall 2020. We will continue using the Open Stax textbook, which is free to download. Summer Plans? Biology 151 will be offered this summer during Summer Session I. The Lab portion of the course will not be offered during the Summer Session. Contact Prof Ewy for more information.

Other Transitions

Please congratulate Dr. Sirsat next time you see her as Baby #2 won’t make it into the newsletter as he’s not arriving until April 28th. Following this, she will be on family leave during the Fall semester, teaching just a single (and brand new!) course (see next page!!)

Biology on Facebook, Instagram and TikTok

Did you know that the Biology Department has a Facebook page? Please connect with us online through Facebook. You will find department announcements as well as information about internships, department seminars, and interesting science news.

https://www.facebook.com/SunyPotsdamBiology/
POTSDAM PATHWAYS

New Course!!!  BIOL 301 Communicating in Biology
Dr. Sarah Sirsat
MWF 10:00 – 10:50  This course carries the CM (Communicating in the Major) designator!

“Nothing in science has any value to society if it is not communicated, and scientists are beginning to learn their social obligations.” – Anne Roe, 20th century American psychologist and writer

Communication is a key component of our daily lives and in an ever-increasingly connected world, knowing how to communicate has become an imperative life skill. Such an important ability is all the more crucial for scientists, upon whose shoulders the burden of sharing our knowledge with the world, falls. BIOL 301, which fulfills the Communicating in the Major (CM) designator of the Potsdam Pathways Program, is a newly offered course which introduces students to the numerous, discipline-specific modes of oral and written communication utilized in the biological sciences and provide a “communication toolbox” useful for future endeavors. Reading, discussion, and critique of peer-reviewed publications will provide students with an understanding of the principles and conventions of scientific writing while equipping students with skills to analyze the effectiveness of other modes of communication. Students will refine their speaking and writing skills through a series of writing assignments, class discussions, and visual and oral presentations throughout the semester while developing skills needed to communicate effectively and share biological concepts concisely and accurately in their future STEM courses and chosen profession.

WAYS 101  The Ones Without a Voice: International Conservation of Wildlife – 3 cr
Dr. Bridget Amulike  MWF 11:00– 11:50
NEW AND IMPROVED COURSES


*Dr. Gordon Plague*

Wednesday 5:00-7:50 PM

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 312 – Insect Ecology (4 credits)

*Drs. Snyder and Plague*

Lectures: MWF 1:00 – 1:50 PM, Lab Wednesdays 2:00 – 4:50

Insects are by far the most species-rich Class of animals on the planet. As such, they exhibit an amazing diversity of ecological adaptations and behaviors, and they have an outsized impact on many ecosystems. In this class, we will explore insect ecology, behavior, evolution, and the effects of insects on humans. Numerous field trips to observe and collect insects will get us into the Adirondacks and surrounding areas, and students will prepare and curate an insect collection. This class satisfies an upper division lab credit requirement.
BIOL 334 – Biology of Woody Plants  
*Dr. Johnson*  
*Meeting Times: Lecture MW 11:00-11:50; Lab 2:00-4:50 Tuesdays*

**Course Description:**  
This course is about trees and shrubs. It emphasizes identification, ecological and silvicultural characteristics of native and introduced woody plants (trees, shrubs, and vines). Initial lectures will deal with basic introductory botany, including tissue types and plant organs, plant reproduction and the origins and taxonomy of major plant groups. However, the primary focus of the course concerns woody plants; later lectures will cover the natural history, distribution, silvics, economic uses and ecology of selected species, the origin, physics, chemistry, morphology and physiology of trees and wood and topics in forest ecology and management. Laboratory exercises and field trips will focus on learning to identify about 100 species of woody plants (plus a few important ferns and herbaceous species) using leaves, bark, fruits, and winter twigs. Field trips will include visits to diverse natural habitat types in the area, as well as the Botanical Gardens in Montreal and some private lands. Students may assist in development of an arboretum and projects to map and label specimen trees and shrubs on campus. Evaluations will be based on class participation, three lecture exams, group or individual projects including plant collections, and weekly field and lab quizzes.

*Next year’s class project will be to participate in an inventory all the campus trees and shrubs and start the planning for a campus Arboretum!*  

BIOL 401 – Exercise Physiology  
*Dr. Schreer*

Lecture Tues, Thurs 9:30-10:45am, Lab Monday 2:00-4:50pm.

Want a class where you can exercise in lab…and think about exercise in lecture? Getting an education and getting fit at the same time. Who doesn’t want that? And get a UD bio elective or the bio physiology requirement to boot.

Any questions, please contact Dr. Schreer at schreejf@potsdam.edu.
BIOL 403 – Human Anatomy and Physiology I 
*Dr. Schreer*

Lecture Tues, Thurs 11:00-12:15am, Lab Tuesday or Thursday 2:00-4:50pm.

Most graduate programs in the health fields require a two-term, upper division, human anatomy and physiology course with labs. Well, here it is! **And as a bonus, the second term of this course counts as the physiology requirement for the bio major. The first term counts as an elective and is a requirement to get into the second term.** If you already have the physiology requirement, you get 8 credits of biology electives from these two courses. This fall I’m offering the first term of this course which includes basic orientation of the human body, chemistry of living cells, cells, tissues, integumentary system, skeletal system, and nervous system. The second term in the spring (Biol 404) will cover the muscular system, cardiovascular system, lymph system, immune system, respiratory system, digestive system, nutrition, metabolism, temperature regulation, urinary system, osmotic balance, and reproductive system. In the lab, we will alternate between detailed dissections of the cat and physiological experiments related to the system covered in the dissection. This course will be very demanding, but we'll all learn a ton and you'll be thanking me when you take your gross anatomy course in graduate school. And by the way, gross anatomy is a serious weed-out course so the more prepared you are ahead of time, the better.

HLTH 370 – Health Coaches II 
*Dr. Robert Ewy*

Looking for experience working with patients? SUNY Potsdam has teamed with Canton Potsdam Hospital (CPH) to train students to work with community members who have chronic conditions such as diabetes, COPD, or heart disease. If you have taken Health Coaches I (BIOL/HLTH 270) you can enroll in HLTH 370 "Health Coaches II" Students are paired with a community member who has a chronic condition. Together the health coach and patient will work to develop small patient-centered goals to improve quality of health. This kind of experience looks great on an application to a health professions program such as MD, DO, PA, and PT, and will give you valuable experience in working with patients and first-hand insights into our health care system. You will learn more than you can imagine about working with patients! The course meets Mondays 5:30-7:10 pm. You can earn 2 hours of either BIOL or HLTH credit. See Prof Ewy for more questions.

Don't pay extra! If your required textbook is an "Open Educational Resource" book, you do not need to pay a fee to get it. Last fall, there was a $7 optional fee listed on the College's bookstore website for "Open Stax" Texts (Biol 100, 151, 152, and 403). You do not need to pay this fee. Simply get the URL from the professor teaching your course.
BIOL 319 - Evolutionary Biology
Dr. Conley
Tuesday and Thursday, 11:30-12:45am

BIOL 319 - Evolutionary Biology
Dr. Walter J. Conley
"Nothing in biology makes sense except in the light of evolution."
Theodosius Dobzhansky, 1973

Evolution is the most important concept in the natural sciences. Evolutionary Biology examines the mechanisms that have resulted in the rich diversity of life. Students will explore connections between natural selection and Mendelian and molecular genetics, population biology, form and function, sexual selection, development, the history of life through the fossil record, and human evolution. Students often share that Evolutionary Biology is a biology elective that "brings it all together."

Love Biology? – Teach it!
The State of New York and the nation are experiencing a massive teacher shortage. Areas of greatest need include all STEM fields. There are many openings for biology, and all of the natural sciences, educators in every school district, and every state. If you love biology, and want to share that passion with others, the teaching profession offers opportunities to positively influence the lives of many. SUNY Potsdam has been a pioneer in teacher education, housing the oldest teacher preparation program in SUNY, and among the first in the nation. Our BA/MST option provides professional certification while preparing students for a lifetime of success in the classroom. If interested, please contact your academic advisor.
**BIOL 326 – Immunobiology**

Dr. Laura Rhoads  
Lecture: Tuesday/Thursday 9:30 – 10:45

The immune system of an organism consists of a complex group of both cells and the products of those cells that protect the body against foreign invaders. Immunology is the study of the immune system and includes a great deal of genetics and cellular biology material. We will address the parts of the immune system and how it functions to protect the body from disease, and what happens when those protective mechanisms fail to keep the body from infection, autoimmunity, or even cancer. We will look at vaccine developments and how science is trying to help the immune system get up to speed. Case studies and research material will be used throughout the class and in exams to illustrate the concepts. If you have had enough of COVID, come and learn about how the immune system fights a whole variety of pathogens!

**BIOL 407 – Cell Physiology**

Dr. Laura Rhoads  
Lecture Tuesday/Thursday 11:00 – 12:15; Lab Tuesday 2:00 – 4:50 pm

Cell physiology is the study of living organisms at the cellular level. This course will take you through all of the parts of a cell, looking at both the structure and the functions of biomolecules and organelles. The accompanying lab will give you hands-on opportunities to work with cells from across the living kingdoms of eukaryotic organisms—animal, plant, fungi and protist. Students will perform an independent project based upon the techniques learned throughout the lab. The lecture includes short writing assignments and exams that have a research focus. This course counts for the physiology requirement for the biology major; if you are looking for an upper-level elective and have already completed one of the physiology courses, please contact me about an override to remove the lab requirement.

**SUMMER COURSES!!!  **BIOL 151 and BIOL 480 (The Biology of Pandemics)

Dr. Ewy

Summer Plans? Biology 151 will be offered asynchronously online this summer during Summer Session I. The Lab portion of the course will not be offered during the Summer Session. I will also offer Biol 480 "The Biology Pandemics." In this course you will learn about the history of pandemics, the biological origins and spread, where pandemics begin, and how humans have responded to them. Biol 480 is a three-hour class that does count towards your upper division electives for the Biology major. This course is online and asynchronous.
BIOL 300 – Ecology
Dr. Robert Snyder
Lecture Monday/Wednesday/Friday 9:00 am – 9:50 am. Lab options: M or Th 2:00 pm- 4:50 pm

What Is Ecology?
Ecology is the study of the relationships between living organisms, including humans, and their physical environment; it seeks to understand the vital connections between plants and animals and the world around them. Ecology also provides information about the benefits of ecosystems and how we can use Earth’s resources in ways that leave the environment healthy for future generations.

Ecologists study these relationships among organisms and habitats of many different sizes, ranging from the study of microscopic bacteria growing in a fish tank, to the complex interactions between the thousands of plant, animal, and other communities found in a desert.

Ecologists also study many kinds of environments. For example, ecologists may study microbes living in the soil under your feet or animals and plants in a rainforest or the ocean.

The Role of Ecology in Our Lives
The many specialties within ecology, such as marine, vegetation, and statistical ecology, provide us with information to better understand the world around us. This information also can help us improve our environment, manage our natural resources, and protect human health.

- Ecological Society of America

Catalog description: BIOL 300 – Ecology (3-4) Physical environment of terrestrial and fresh-water eco- systems, interspecific and intraspecific relationships, speciation, demography, growth and regulation of populations, energy flow, community organization and development. Prerequisites: BIOL 151 or 125, and 152. Lab optional*. Gen Ed: WI (writing intensive) lab only.

*Biology majors have the option to take either Ecology (BIOL 300 lab) or Genetics (BIOL 311) lab. Students should consult with their Biology advisor to determine which option is best. Students can take both labs, with the additional lab counted as Biology Elective credit.

TA’s needed
Ecology Lab: I am looking for 1-2 Ecology TA’s. TA’s must have taken BIOL 300. TA’s will drive College van to field sites, among other duties. Please contact Dr. Snyder (snyderrl@potsdam.edu) if interested.

Photos from Lab trip to Cold Brook

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Every day there is more information about how our genes affect health. Some diseases are rather straightforward – if you have the wrong allele, then you get the disease. However, those well-known and well-studied diseases (like cystic fibrosis or sickle cell anemia) are the exception, not the norm and even they are more complicated than they seem at first glance. The influence of most genes is much more subtle. They may set off a cascade of events that eventually results in a disease phenotype (like Huntington Disease, see images) or they are just one minor player in a much larger cast that includes other genes and/or environmental influences (like “heart disease” or many cancers). Combine this with the fact that healthcare is moving more to a “personalized medicine” format, and you can see that genetics is an important aspect of modern medicine. Recently tests have become available to scan for over 200 genetic disorders. This course explores various aspects of genetic-based diseases, while looking into the current peer-reviewed literature and giving students a chance to explore a few diseases in more detail.

Right: Neuron with inclusion body (stained for visualization) caused by mutant huntingtin proteins.

Left: Brain deterioration caused by Huntington Disease.

Both images from: https://en.wikipedia.org/w/index.php?title=Huntington%27s_disease&oldid=1074515936

**BIOL/ENVR 304 Sustainable Agriculture**

Ray Bowdish and Dr. Kate Cleary

Prerequisites: BIOL 151 or 152 or 100 or 125 or ENVR 110.

Tues/Thurs 9:30-12:15 (combined lecture and lab)

This course introduces students to the ecological, economic and social dimensions of agriculture. Students examine different types of agriculture, from large-scale industrialized monocultures to agroforestry, organic and urban farming systems and ask, “How did this come about?”, “Is it sustainable?” and “How can it be more sustainable?”. Readings address topics of land use, labor rights, agribusiness and global trade issues, food: security, literacy and sovereignty, and genetically modified organisms (GMOs).

The lab portion of the course includes farm visits and experiential learning projects in the WISER Center greenhouses and Cecile Garden (the campus food security garden). We will visit four local farms with varying agricultural practices and evaluate their sustainability. Students will also grow microgreen crops themselves and act as their own Community Supported Agriculture (CSA) business with PACES dining services.
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. Send Prof Ewy an email: ewyr@potsdam.edu and include the following information:

Your name
What career you want to pursue (dental, medicine, veterinary, etc.)
Your year classification (1st, 2nd, 3rd, 4th)

Professional school test prep If you are interested in an on-campus MCAT or other pre-professional test prep tutorial let Prof Ewy know. I want to see if there is enough interest to formalize a "test-prep" courses.

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 labs. This is an excellent way to review your Biology and help out the Intro class.

Committee Letters of Recommendation

Applying to Medical School (or any other program that requires a committee letter) for the upcoming cycle? HPAC interviews will be done in April. Please have your letters of recommendation to Prof Ewy by the end of March. For more information, contact Prof Ewy.

Interested in pursuing a career in a Health Profession? Enroll in the Health Professions Moodle course. There you will find information on all kinds of health-related programs including: MD, DO, PA, PT, Vet, Dental, OT, and Optometry, as well as medical related research programs. You can self-enroll and will receive periodic notices of events both on and off campus that pertain to various health-related careers. Talk to Profs Schreer, Trybula, or Ewy for more information.

Pre-health club

There is a student-run pre-health club on campus. This is another valuable resource for information about various health professional graduate programs. You can talk to students who have taken exams such as the MCAT, GRE, and other exams, as well as what out of class experiences you should be doing to help you get into the program you want. The current contact person is Arantxa Valdez. This link will get you to all the clubs and student organizations: https://getinvolved.potsdam.edu/organizations
SUMMER TRAVEL COURSE

Marine Biology for Summer 2022

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. As part of the consortium, Potsdam students only pay in-state tuition, room, and meals. Classes fill fast so please be attentive to opening dates if interested. For complete details, please visit the GCRL website http://gcrl.usm.edu/summer_field/index.php The website includes update Covid restrictions. Interested students should also contact our GCRL advisor, Dr. Conley (conleywj@potsdam.edu).

Potsdam students Matt Nobles and Ceira Dawson with their Atlantic Sharpnose shark (Rhizoprionodon terraenova) - catch and release.
Winter Break 2022 – 2023

BIOL 395 – Tropical Ecology and Conservation - Belize
Dr. Glenn Johnson

Spend New Year’s Eve in a remote tropical rain forest in Belize!

Consider a Winter travel course tentatively leaving snowy Potsdam on December 27 and returning on January 8, 2022. See Dr. Johnson (johnsong@potsdam.edu; x2710; 231 Timerman) for details. We register during Fall and attend 3-4 meetings in late November and December. Over this two-week course to Belize students will visit unique biological communities including tropical hardwood rain forests, mountain pinelands, mangroves, coral reefs and several freshwater wetland communities such as freshwater lagoons, tropical streams and rivers. Participants will visit Mayan ruins and see first-hand the ecological problems that beset some parts of this small Central American country.

Prerequisites: BIOL 300 or permission of instructor.

Contact Dr. Johnson for more details.

Photos: Jessen Swider and Glenn Johnson
The WISER Center is the Biology Department’s unique organization for applied learning and outreach! You can find us in Room 205, Stowell Hall. The Center’s classroom and greenhouses, support activities and demonstrations for classes, labs, courses and programs in Biology, Chemistry, Anthropology, Education and Public Health and Human Performance. The Center is run by the WISER Staff comprising the coordinator, student and community-member volunteers, interns, and research students. They do amazing things like growing food in the PACES CCSA program, educating plant owners and helping “green the campus” through the Health Plant Initiative, fighting food insecurity with The Cecilie Garden Project, helping improve wellness with Yoga in the Greenhouse and The Pet Plants Project, and improving education with Tower Gardens and the curriculum from the Green Bronx Machine to support teachers in our North Country Food and Nutritional Education program series. All students, regardless of their major, can be a part of our WISER Staff! Please visit the WISER Center via Stowell 205 or email wiser@potsdam.edu, for more information. Also check out: https://getinvolved.potsdam.edu/organization/wiser

Here are some things we do at the WISER!! Upper left, tomatoes from The Cecilie Garden Project; upper right, Tower Gardens; lower left, Plant Propagation Workshop; lower right Yoga in the Greenhouse
**WISER Internship Guide**

Students in any major can be a *WISER Intern*. In the WISER Center and among its sites around campus, you will engage in applied learning programs designed to teach a variety of horticultural skills. As a member of our WISER Staff, interns help plan and produce events, maintain the WISER Center and its plants, practice urban farming and working with other student volunteers and researchers, to further a culture of sustainability on campus and in our region! Working at the WISER is a fantastic way to learn about our campus, the local community, and the earth as you enrich your understanding of issues around sustainability and ecology and add active learning to your resume or C.V.!

Choose from the following internship opportunities.

- **General Intern** (1-2 credits): This entry-level internship is a prerequisite* for all other job descriptions. Inters support all programs and facilities of the WISER.
- **Plant Doctor** (2-4 credits): Supports the Healthy Plant Initiative (HPI) to increase number and health of plants on campus.
- **Campus Urban Farmer** (3-6 credits): Operates the Campus Community Supported Agriculture (CCSA) program and grows food for PACES dining services.
- **Wellness Interns** (1-3 credits): Operate wellness programs like Yoga in the Greenhouse & The Pet Plants initiative.
- **Community Farmer** (4-6 credits) – are Fall and Summer term opportunities to coordinate The Cecilie Garden Project with local non-profits to grow food to increase local food security. This internship can serve as Environmental Studies 391 course, Field Project.
- **Assistant Coordinator** (3-6 credits) – Experienced intern helps schedule, train, and work with other interns in the WISER Center staff. Intern works closely with the Center Coordinator to plan and implement events and programs, run weekly meetings and create weekly reports on WISER Center activities.
- **Campus Beekeeper** (1-3 credits) – Interns assist, or lead activities and tasks required to maintain the campus apiary. **
- **New Outreach & social media Internship** – (2-4 credits) Produce content the WISER Center and Biology Department social media platforms, create advertising, promote events and programing with marketing and advertising initiatives.

*Prerequisites may be waived if students can demonstrate sufficient experience in the General Internship skill set.**
Getting Started as a WISER Intern

We follow the internship process required by the Experiential Education Office (EEO).
Here is what you need to do
1. First click here to see if you qualify...
2. Schedule a meeting with the WISER Coordinator by emailing: wiser@potsdam.edu or by sending an Outlook Invitation to: bowdisrp@potsdam.edu.
3. Meet with the coordinator and determine which internship descriptions best fit your goals.
4. You will receive an email with an Internship Proposal Template (IPT) attachment appropriate to the internship you selected.
5. Edit your IPT and attach it to an email it to: wiser@potsdam.edu for preapproval.
   a. This step may repeat depending on the completeness of your ITP.
   b. Once you have preapproval from the WISER Coordinator you need apply for full approval for academic credit. Full instructions are here.

Internship Opportunity Off Campus!!

Study Horticulture at Never Tire Farm
Each Spring in Lisbon NY, Never Tire Farm seeks motivated students 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. Talk to Ray Bowdish about this opportunity.
Profile of a Recent Bio Graduate: Jason Gokey, Ph.D.

My name is Jason Gokey and I graduated from SUNY Potsdam in 2009 with Bachelor of Science degrees in Biology and Chemistry. I am originally from Lisbon, New York where I grew up fishing and wandering around occasionally finding these fun little turtles with yellow throats (turns out I would hang out with these a bit more). After high school at Lisbon Central School, I moved on to SUNY Potsdam, where I had the initial intent of joining the biology department. While in my first year I found out about Dr. Jason Schreer’s work in fisheries and figured I like to fish, let’s see what this is about. I contacted Jason and set out at coming up with a research project to understand the effects of deep-water angling on deep water angling in fishes of the St. Lawrence. This work, under the mentorship of Dr. Schreer, would go on to become my first peer-reviewed publication. While at Potsdam I also joined the group working with Dr. Glenn Johnson assessing populations of the Blanding’s turtle (the above mentioned yellow throated turtles) and I later would join Glenn on 2 trips to study the biotics of southern Florida over the winter sessions. I also joined the biochemistry lab of Dr. David Gingrich to gain experience in bench science studying unicellular ciliated Chlamydomonas. During my time at SUNY Potsdam, I had an excellent research experience, found a great array of extracurricular activities and made many life-long friends both in and out of Stowell Hall.

After SUNY Potsdam, I decided to continue with the SUNY theme, by heading to Upstate Medical University in Syracuse New York. I knew I had an interest in gaining a deeper understanding of molecular pathways involved in human disease and, as such, I joined the lab of Dr. Jeffrey Amack where I would learn to use model organisms (in this case I got to continue working with fish) to understand disease mechanisms. While in the Amack lab, I studied how a proton pump, the V-ATPase, regulates guiding of the left-right body axis and in particular cardiac looping, and how these biological phenomena contribute to congenital birth defects including heart abnormalities. While in the Amack lab, I met my now wife Bridget, re-started my childhood interest in playing hockey, gained an extensive knowledge in molecular pathways and obtained my Ph.D. in cellular and developmental biology in 2015.
Once I obtained my Ph.D., I migrated to Cincinnati Ohio, where I joined the research group of Dr. Jeffrey Whitsett at Cincinnati Children’s Hospital Medical Center to study lung development and disease. The Whitsett group is well-known for work in developing mouse models to study lung development and disease, surfactant biology, and cell culture models that can translate to human disease. It was in the Whitsett research team that I developed an interest in Pulmonary Fibrosis, a disease in which patients develop fibrotic scarring of the lung that causes progressive damage that prevents the lung’s ability to perform respiration leading to loss of lung function.

It was through my study of Pulmonary Fibrosis that I now find myself living outside of Nashville Tennessee, with my wife, our two sheep, chickens and cats. I now work at Vanderbilt University Medical Center with a junior faculty position under the mentorship of Dr. Jon Kropinski and Tim Blackwell. The department I find myself in is well established in pursuing the factors that cause adult lung diseases with the goal to find treatment options for these patients. I currently have a small lab in which we utilize genetic mouse models and lung injury models, cell culture, and organoid models of the lung to understand the role of certain genes in causing lung disease. The great thing about pursuing a career in research is that every day is different, whether you are learning something new or finding a new way to not do something, it is always interesting. As I am in my office writing this, I am in the process of writing grants, a paper, peer-reviewing papers, and planning experiments for next week, I realize that this all started about 15 years ago at SUNY Potsdam wondering what was going on with those fish I caught in deep water in the St. Lawrence River and looking for turtles in a sand pit out on Ray Bowdish’s land around the corner from where I grew up.
WORK STUDY

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

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 Profs. This also counts as a 1 credit upper division bio course. Contact your Profs before the end of the semester if you are interested and see some possibilities below.

Teaching Assistant positions in General Biology labs
If you are interested in becoming a Teaching Assistant in the General Biology labs (BIOL 151 and 152) please contact Dr. Jan Trybula trybulj@potsdam.edu before the end of the spring semester. Basic requirements: 1) successful completion of Biology 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 labs. This is a great way to reinforce your 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. Preparing for MCATs or another exam that will test your Biology knowledge? The best way to really know Biology is to teach it! This is an excellent way to review your Biology and help out the Intro class.

Lecture TA’s (General Biology or Ecology): 1 or 2 students to assist in classroom activities and lead weekly review “Successions”. Must be able to attend MWF 11-11:50(Biol 152) or MWF 9-9:50 (BIOL 300) lecture. Please contact Dr. Snyder (snyderrl@potsdam.edu) if interested.

Dr. Ewy is looking for TAs for Biology 100 (non–majors Biology). Bio 100 lab has (4) two-hour sections, all on Thursday. See Prof Ewy for more details.

TA’s needed

Ecology Lab: I am looking for 1-2 Ecology TA’s. TA’s must have taken BIOL 300. TA’s will drive College van to field sites, among other duties. Please contact Dr. Snyder (snyderrl@potsdam.edu) if interested.
**INTERNSHIPS**

**Biology Department Applied Learning Opportunities**

**New internship: Laboratory Technician.** If you’ve considered laboratory research or management after graduation, this internship may be for you. Topics and experiences covered include: maintaining a lab notebook; making solutions; model systems; hazardous waste disposal and chemical storage; equipment use, troubleshooting, maintenance and repair; media preparation: antibiotics and additives; molecular biology techniques; field trip to Clarkson to see their facilities; creative problem solving (or, Don’t panic: how to fix anything with duct tape and popsicle sticks); and ordering and stocking supplies. Open to one student per semester depending on instructor availability. Contact Rachel Wallace (wallacrm@potsdam.edu) if you’re interested in applying or learning more.

**Care and Handling of Display Animals in the Biology Department at SUNY Potsdam**
Fall 2022 Wildlife Internship Opportunity

*Have you always wondered about the secret lives of wild animals? Are you interested in a career in conservation biology or land management?* In Fall 2022, Dr. Kate Cleary (Environmental Studies), Dr. Bridget Amulike (Biology), and Dr. Glenn Johnson (Biology), have an opening for 1-2 interns interested in working on an ongoing camera trap project on and around the SUNY Potsdam campus.

**The work:** You would be trained on using camera traps, setting up and monitoring the traps, and analyzing the resulting data. You may also work on designing special camera traps used to capture smaller mammals.

**Credits:** Can be 1-3 credits, depending on the time you are interested in investing.

Your work would be part of a larger project that we and Dr. Jess Rogers (Environmental Studies) have started to evaluate the differences in mammal distributions in rural areas, developed areas, and the rural-developed interface.

**CONTACT:** Dr. Cleary ([clearyka@potsdam.edu](mailto:clearyka@potsdam.edu)), and put CAMERA TRAPs in the subject line.

**Looking Ahead:** This project will continue on into the future! If you are interested in working on this in the Summer of 2023, please contact Dr. Cleary, Dr. Johnson ([johnsong@potsdam.edu](mailto:johnsong@potsdam.edu)), Dr. Rogers ([rogersje@potsdam.edu](mailto:rogersje@potsdam.edu)) or Dr. Amulike ([amulikbb@potsdam.edu](mailto:amulikbb@potsdam.edu)).
What can you do with a Biology Degree?!

Here’s a few web resources!


https://www.trade-schools.net/articles/biology-careers.asp

https://www.indeed.com/q-Bachelors-Biology-jobs.html

For those interested in Natural Resources, Conservation and Wildlife:

https:// wfscjobs.tamu.edu/job-board/

Thinking of Grad School in Biology?:

https://www.gradschools.com/programs/biology

A poisonous bird! Meet the Variable Pitohui. A native of (and endemic to) New Guinea. This bird, and its close relatives the hooded pitohuis are the only known poisonous birds. Their skin and feathers contain powerful batrachotoxins, neurotoxic alkaloids also found in some poison dart frogs of South America. They do not produce the toxins themselves, but rather get it from certain beetles in their diet. The bright colors are advertising this powerful defense to would-be predators. Although native New Guineans knew all about them and avoided eating them, this feature was “discovered” by research scientists that were working with them where they noticed that their mouth always seemed to tingle after handling the birds…always a good idea to wash your hands after handling wild animals!!
New Major in Environmental Science!

Notice: Faculty in Biology, Geology, Physics, Chemistry and Environmental Studies have developed a brand-new **Major and Minor in Environmental Science**. The fruits of this effort are on the books beginning **Spring 2022**. Here’s a brief overview, however, if you are interested in exploring this exciting new major, email or stop by and chat with Drs. Johnson, Rygel, and/or Rogers to hear more!

### Required Courses

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<th>Credits</th>
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<tr>
<td>BIOL 151, General Biology I + Lab</td>
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<td>ENVR 110, Intro to Environmental Studies</td>
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<tr>
<td>BIOL 152, General Biology II + Lab</td>
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<td>GEOL 101, Environmental Geology + Lab</td>
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<tr>
<td>CHEM 105, General Chemistry I + Lab</td>
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<td>MATH 151, Calculus I</td>
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<td>CHEM 106, General Chemistry II + Lab</td>
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<td>STAT 100, Probability and Statistics</td>
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### Core Environmental Science Classes (28 credits)

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<td>BIOL 300, Ecology + Lab</td>
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<td>GEOL 410, Hydrogeology + Lab</td>
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<tr>
<td>ESCI 200, Environmental Science</td>
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<td>CHEM 320, Environmental Analysis</td>
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<td>ESCI 301, Soil Science + Lab</td>
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<td>GEOL 425, Scientific Communication or ENVR 490 Senior Seminar</td>
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<tr>
<td>GEOL 320, Geochemistry</td>
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<td>POLS 414, Environmental Law</td>
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### Elective Courses (14 credits from the following)

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<tr>
<td>BIOL 310, Marine Biology</td>
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<td>ENVR 391, Field Project</td>
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<tr>
<td>BIOL 312, Insect Ecology</td>
<td>4</td>
<td>ESCI 495, Env. Science Research</td>
<td>1-3</td>
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<tr>
<td>BIOL 334, Biology of Woody Plants</td>
<td>3</td>
<td>GEOL 350, Geomorphology</td>
<td>4</td>
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<tr>
<td>BIOL 400, Field Ecology</td>
<td>4</td>
<td>GEOL 380, Climate Change: Past &amp; Present</td>
<td>3</td>
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<tr>
<td>BIOL 402, Conservation and Wildlife Management</td>
<td>3</td>
<td>GEOL 407, Applied Geophysics</td>
<td>3</td>
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<tr>
<td>BIOL 408, Wetland Ecology</td>
<td>3</td>
<td>GEOL 440, Economic Geology</td>
<td>3</td>
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<tr>
<td>BIOL 409, Freshwater Biology</td>
<td>4</td>
<td>GISC 101, Intro. to GIS</td>
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<tr>
<td>CHEM 311, Quantitative Analysis</td>
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<td>GISC 302, Remote Sensing</td>
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<tr>
<td>CHEM 321, The Sustainable World or ENVR 120, Intro. To Sustainability</td>
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<td>SOCI 340, Environment and Society or SOCI 341, Environmental Justice</td>
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<td>CHEM 341, Organic Chemistry I</td>
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<td>CHEM 342, Organic Chemistry II</td>
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<td>PHIL 330, Environmental Ethics</td>
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<td>CHEM 415, Instrumental Analysis</td>
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<td>PHYS 325, Energy and the Environment</td>
<td>3</td>
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<tr>
<td>ECON 320, Economy and the Environment</td>
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<td>PHYS 330, Meteorology</td>
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</tbody>
</table>

*Students can count a total of no more than three credits toward the electives

Students can count a total of no more than three credits toward the electives

*Highly recommended for all students
BIOLOGY’S HERBARIUM

The SUNY Potsdam Herbarium is shaping up! An herbarium is a library of preserved plant specimens that have been collected or donated over the years. Herbaria provide a permanent record of plant diversity, mark the movement of species in or out of a geographic area, and provide a tangible example of a species’ anatomy. Our collection encompasses 1851 specimens in 145 families and 53 orders. They’ve been organized according to APG (Angiosperm Phylogeny Group) IV classification and linear sequencing as generated by Christenhusz et al. (2011) for our lower vascular and non-vascular plant specimens.

Since 2017 we’ve been organizing the physical collection, getting STW 111A cleared out and set up to be a facility, databasing the collection, and now we’re mounting and repairing the specimens. The end goal is inclusion in a SUNY-wide Herbarium Consortium, with all specimens digitized and fully accessible for classroom and research use.

Dan Marro ’20 was hugely instrumental in the initial reorganization of the collection, along with the help of Victoria Saladino ’18. In more recent times, Stevie Phelabaum ’21 and Sai Barnes ’23 have led the charge in repairing and mounting specimens, along with contributions by Diana Marji.

Stevie and Sai completed mounting and repairing the Magnoliids and Monocots last Spring. Sai recently completed non-vascular and vascular lower plants and is steadily working her way through our gymnosperm collection. Next stop is the daunting eudicot collection!

Interested in learning more or getting involved in the SUNY Potsdam Herbarium? Email Rachel Wallace (wallacrm@potsdam.edu) or stop by STW 111A for a visit!
**Research with Profs**

**Dr. Sarah Sirsat – Physiology**

Physiology encompasses all biological levels from molecular to whole organism; as a physiologist I have an interest in the how and why at all of these levels. I am especially fascinated by the interplay of avian biological systems and the role phenotype, the outward manifestation of an organism’s genetic makeup, plays in physiological responses. My research explores the relationship of phenotype and physiology using a small, precocial bird known as the Chinese Painted Quail or King Quail. Numerous pattern and color mutations have been developed in captivity for this species. I currently examine physiological differences related to a recessive white pattern that my students and I have successfully developed into a pure-breeding lineage. These spotted white birds show different growth rates, organ masses, and morphological measurements than the wild type color. My research aims to determine the physiological mechanisms behind these differences, such as changes in metabolism and differences in mitochondrial function of various tissue types.

**Dr. Jan Trybula – Molecular Ecotoxicology**

My research is tied to many aspects of genetics and biodiversity. I’m interested in molecular ecotoxicology, how toxins in the environment affect the genetics of various organisms. I’m also interested in the biodiversity of emergent aquatic insects. Worldwide insect numbers and diversity are in decline and pollutants are thought to be one of the greatest contributors.

Students in my lab examine a wide variety of ways to determine genetic damage caused by a wide variety of pollutants. We exam toxicity by examining the chromosomes, DNA genetic markers, and expressed proteins. We examine the toxicity of in-lab exposures and natural and anthropogenic exposures in the environment. If you’re interested in learning more, please contact me.
Dr. Glenn Johnson – Conservation of Threatened Species
231 Timerman Hall, 267-2710, johnsong@potsdam.edu

I am in the final year of a 3-year funded project on turtle conservation. This involves Blanding’s turtles, a Threatened Species over much of its range, and other regional freshwater turtles species. This project is part of a grant from the US Fish and Wildlife Service, 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, 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.

Creating Turtle Nesting Habitat: Drone view of a site in Lisbon Pre (above left, early fall) and Post (above right, late fall) Treatment. The wetland turtles occupy can be seen in the background. It took 111 20-ton truckloads to cover the 0.75-acre site with 12 inches of fine clean sand (right).
**Dr. Robert Ewy - Research experience: Medicinal Properties of Willows**

The two primary projects in my lab are sustainable energy production and herbal medicines, both from shrub willow. Yes, you can get research credit for making energy! Currently, students in my lab are quantifying Salicylic Acid in 16 varieties of willow. This project will continue on in the fall. 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 to work in my lab are curiosity, a willingness to solve problems, and the desire to learn outside of a book.

You can earn research credit via Biology 485 or an internship.

---

**Dr. Rob Snyder – Genomics/Animal Behavior**

![Image of Dr. Rob Snyder]

My main project is looking at the role of primary gut symbionts, in plant feeding insect speciation. Basically, gut bacteria provide the insect essential amino acids synthesis pathways. Closely related species have different diets and require different pathways. This research is interested in explaining how insects adapt and diverge to new diets, which leads to speciation. To date we have sequenced the genomes of two co-symbionts and are using that information to look for patterns in the amino acid pathways between 9 closely related species.

Other projects include egg laying behavior of the Two-spotted treehopper, and the effect of the invasive Viburnum leaf beetle on Two-spotted treehopper habitat.

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 (307 Stowell).
Dr. Jessica Rogers

Job Announcement:
Paid Summer Research Assistant 2021 – INVASIVE PLANT SPECIES RESEARCH

DEADLINE: March 15

Dr. Rogers is seeking 1-2 motivated students to work with her during summer of 2022 – the timing is flexible; a minimum of 5 weeks commitment is required. She is continuing a research project on a local invasive species, purple loosestrife (*Lythrum salicaria*), present in wetlands and along roadsides. The study will involve traveling local roads by vehicle and on foot both with Dr. Rogers and other interns as well as alone to find areas along these roads that demonstrate the presence of purple loosestrife. Measuring these infestations and examining plants for herbivory (damage from insects) and mapping these locations with this kind of data will be done throughout the North Country.

The majority of the work will be propagating a biocontrol, *Galerucella* beetles in the WISER center greenhouse at SUNY Potsdam. Field work will also take place at the Red Barn Preserve in Morristown, NY. Work will be 20-30 hrs per week starting immediately after graduation and ending mid-July. The requirements in a given week are uncertain based on the weather and plants/insects requirements. The compensation for this work is $15/hr with a minimum total salary guarantee when you sign on, regardless of hours. The start and end dates are somewhat flexible and will depend somewhat on the availability of interns and of the target species.

Dates – multiple people could be hired for each time period or just 2 for the entire summer, please indicate your availability.

~10hrs/week May 15-May 30 depending on weather to create beetle hatchery
~2-5 hours/week May 30-July 10 – Tending beetle hatchery
~20 hrs/week July 10-20 Harvesting, releasing, and monitoring beetles.

Job requirements:
1. The ability to work outside in potentially rigorous environments for many hours in potentially hot or wet environments (hiking boots/shoes are preferred, but sturdy sneakers will suffice)
2. A strong commitment to organization, particularly with computer data/files.
3. A smart phone (iPhone or Android) with the ability to download the free ArcGIS Collector App, and the iMap Invasives app (this won’t be provided, but training in using the apps will be).
4. Good communication skills and interpersonal skills are required

Preferred
1. A valid driver’s license and comfort driving, having your own vehicle is required this summer due to COVID-19 and social distancing.

If you’re interested in the summer research work, please send a basic resume and a cover letter explaining your interest in the project and how it relates to your academic or career goals, including 1 reference from a professor on campus (name and e-mail address is all that is required). Students from all majors will be considered. Send the 2 files to rogersje@potsdam.edu with the subject line SUMMER INTERNSHIP by April 1.
SUNY Potsdam
Lambda Xi Chapter
Beta Beta Beta
National Biological Honors Society

Beta Beta Beta (TriBeta) is a society for students, particularly undergraduates, dedicated to improving the understanding and appreciation of biological study and extending boundaries of human knowledge through scientific research. Since its founding in 1922, more than 200,000 persons have been accepted into lifetime membership, and more than 670 chapters have been established throughout the United States and Puerto Rico.

New member candidates are invited to join BBB every year. Invitations are sent out in March and a new member induction ceremony is in late April.

The membership shall be divided into six classes: regular, associate, graduate, honorary, alumna/us and corporate. Beta Beta Beta is a non-discriminating organization that does not consider age, race, color, creed, sex, national origin or sexual preference.

Regular members shall be:

a) Undergraduate biology majors (BS or BA) at SUNY Potsdam.
b) Shall have completed at least 3 semesters of a four-year curriculum.
c) Shall have completed at least three term courses in biology (BIOL), of which at least one must be upper division (300 or 400 level), with an average 3.25 GPA in those biology courses.
d) Shall have a 3.25 GPA in all courses, and in good academic standing

**Only regular members may hold the constitutionally specified chapter offices, vote on chapter membership nominations and national questions, and represent the chapter or vote at national conventions.

Associate members shall:

a) Shall have completed at least 3 semesters of a four-year curriculum.
b) Shall have completed at least three term courses in biology (BIOL), of which at least one must be upper division (300 or 400 level), with an average 3.25 GPA in those biology courses.
c) Shall have a 3.25 GPA in all courses, and in good academic standing.
### Requirements for Graduation

**Biology (BS)**

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<th>Hours</th>
<th>Grade</th>
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<tbody>
<tr>
<td>151</td>
<td>Gen Bi: Cells and Genetics Lecture</td>
<td>3</td>
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<td>151</td>
<td>Gen Bio Lab</td>
<td>1</td>
<td></td>
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<tr>
<td>152</td>
<td>Gen Bio: Organisms and Ecology Lecture</td>
<td>3</td>
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<tr>
<td>152</td>
<td>Gen Bio Lab</td>
<td>1</td>
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<tr>
<td>300</td>
<td>Ecology Lecture</td>
<td>3</td>
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<tr>
<td>311</td>
<td>Genetics Lecture</td>
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<td>300/311</td>
<td>Ecol or Genetics Lab*</td>
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<td></td>
<td>Physiology Lecture</td>
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**Chemistry Courses**

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<td>106</td>
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**Math Courses**

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<tr>
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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.
### REQUIRED BIOLOGY COURSES
(22 hours)

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<td>Gen Bio: Cells and Genetics</td>
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<td>151</td>
<td>Gen Bio Lab</td>
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<tr>
<td>152</td>
<td>Gen Bio: Organisms and Ecology</td>
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<td>Lab</td>
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<tr>
<td>311</td>
<td>Genetics Lecture</td>
<td>3</td>
<td>______</td>
</tr>
<tr>
<td>300/311</td>
<td>Ecol or Genetics Lab*</td>
<td>1</td>
<td>______</td>
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<tr>
<td></td>
<td>Physiology Lecture</td>
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<td></td>
<td>Physiology Lab</td>
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<tr>
<td>483</td>
<td>Current Topics</td>
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### REQUIRED CHEMISTRY COURSES
(12 hours)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
<th>Grade</th>
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<tbody>
<tr>
<td>105</td>
<td>General Chemistry I</td>
<td>3</td>
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<td>105</td>
<td>General Chemistry I Lab</td>
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<tr>
<td>106</td>
<td>General Chemistry II</td>
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<td>General Chemistry II Lab</td>
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<td>341</td>
<td>Organic Chemistry I</td>
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<td>Organic Chemistry I Lab</td>
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### BIOLOGY ELECTIVES
(15 hours)

<table>
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</tbody>
</table>

No more than 4 cr of BIOL 475, 485, of 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 hours)**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Hrs.</th>
<th>Grade</th>
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<tbody>
<tr>
<td>125</td>
<td>Biological Concepts</td>
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<tr>
<td>125L</td>
<td>Biological Concepts Lecture</td>
<td>3</td>
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<tr>
<td>152</td>
<td>Gen Bio: Organisms and Ecology Lecture</td>
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<tr>
<td>152</td>
<td>Gen Bio: Organisms and Ecology Lab</td>
<td>1</td>
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<tr>
<td>300</td>
<td>Ecology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>Genetics</td>
<td>3</td>
<td></td>
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</tbody>
</table>

**Biology Electives (6 hours)**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Hrs.</th>
<th>Grade</th>
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<tbody>
<tr>
<td>300 L</td>
<td>Ecology Lab (Optional Elective)</td>
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<tr>
<td>311 L</td>
<td>Genetics Lab (Optional Elective)</td>
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</table>

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