



A DIVISION OF THE AMERICAN FARM SCHOOL
Degrees validated by University of Wales Institute, Cardiff

Study Abroad

Edition: 2017 – 2018

Internship Program

Research Internship
& Work Internship

Sample Intern Positions & Research Topics

Terms Offered

Fall Term: Sept. 25 – Dec. 22 (13 weeks)

Spring Term: Jan. 29 – May 18 (16 weeks)

Summer Term: May 21 – June 29 (6 weeks)

Credits Received 3 (optional)

Introduction

The Study Abroad Department of Perrotis College offers two types of internship positions during the Fall, Spring and Summer Terms:

- Research Internship (individual, unpaid)
- Work Internship (individual, unpaid)

Both types of internships are 25-30 hours per week of research/work or related activities in the department where the project is carried out, unless the intern is also taking courses for credit. In these cases, the amount of time dedicated to research/work can be reduced to as little as 15 hours weekly.

Working closely with faculty and study abroad offices at participating universities, Perrotis College identifies specific candidates from each school, and, based on their qualifications and interests, matches them with positions available. The research and unpaid work internships placements are made in consultation with each partner institution.



Work Internship

Work Internship

Work internships can be performed in various divisions on our 160-acre campus. All position placements are made according to student qualifications and interest, as well as department needs.

All interns should possess a strong work ethic, cooperative nature and a positive "can do" attitude. Your time here will be intense, but you will gain useful farming skills and a real appreciation for healthy, delicious food that comes from sustainable, local agriculture.

Interns are required to clean and maintain the farming equipment and fields. Cleanliness procedures and safety practices are a vital component of our work, and expected to be taken seriously.

Intern positions at our educational farm are only appropriate for those **who love to work outdoors**, do not mind getting their **hands dirty** and are prepared to **work early hours**.

Below is a list of positions that interns have held in the past:

- **Selected AFS/Perrotis College Departments** (upon request and availability)
- **Educational Farm Departments:**
 - **Horticulture**
 - **Poultry**
 - **Dairy**

Educational Farm Departments

The School's diversified education and research farm is a living laboratory for students of all ages. Since the School's founding, the Farm has provided students with hands-on experiences that amplify academic learning, bridge disciplines, and spark science-driven innovation.

Managed as part of an integrated agro-ecosystem, the Farm aims to demonstrate sustainable farming methods that are economically viable, socially responsible and ecologically sound.

Occupying close to one third of the School's 350-acre campus, the Farm comprises livestock, horticulture and food processing operations that produce premium products sold on the open market. Student engagement in production, project management and new product development provides invaluable, real-world learning, while sales support the School's extensive scholarship program.

The Farm also provides an invaluable platform for relevant research that strengthens the region's economic competitiveness. Perrotis College students and faculty contribute to this effort through wide-ranging applied research projects. The launch of the Perrotis College Graduate School in 2017 will multiply research opportunities and the transfer of new knowledge to the agro-food sector.

Since the School's founding, the Farm has also served as a training and demonstration center for producers.

Horticulture Unit

The campus's horticulture unit consists of olive groves, vineyard, fruit orchards, vegetable gardens, greenhouses, field crops, a snail farm and many more experimental fields.

The Horticulture internship offers the intern many learning opportunities because it is the only educational unit that allows them to take part in more than one component of the department. As a result, the intern returns home with a broader knowledge and set of skills prepared for different types of products. Below is a short description of each component:

The below internship position is available during the Fall Term (Sept. – Dec):

- **Wine Making & Wine Production:** Interns will assist with the entire process of wine production
 - **Harvesting wine grapes & continuous check of quality control**
 - **Distillation process**
 - **Bottling & labeling of bottles**
 - Some of the products from the schools vineyard: Dry red Macedonian Greek varietal called Xinomavro, traditional white wine; Restina, tsipouro and vinegar
- **Olive Oil Production:** Interns will assist with the entire process of olive oil production
 - **Harvesting olive trees (approximately 1,000 trees on campus!)**
 - **Olive oil processing Machines**
 - **Olive oil tasting & sensory analysis test (understand different varieties of olive oil)**
 - The school produces extra virgin olive oil and table olives
- **Harvesting Pomegranate:** Interns will assist with picking pomegranate and help transfer to local Greek producers for juice making
- **Seedling durum wheat & barley**
- **Packaging Aromatic – Pharmaceutical Plants such as oregano, rosemary, sage, mountain tea and thyme**

The below internship position is available during the Spring Term (Jan. – May):

- **Vineyard Worker:** The most important time of the year is the spring. The intern will perform routine tasks such as cultivating, fertilizing soil, planting, training and pruning vines and picking grapes.
- **Olive Tree Pruning**
- **Seedling Corn for silage**
- **Seedling soya beans and rice: @ Zana's Farm, 50km from campus**
- **General cultivation with agricultural machinery**

The below internship position is available during the Summer Term (May – June):

- **Irrigation & Corp Management**
- **Harvesting Durum wheat, barley & various vegetables**
- **Understand and comply with ISO regulations in all agricultural processes**
- **Olive tree pruning and seedling tasks may also be performed during these months depending on products**

Poultry Unit

The poultry division is an integral part of the farm. Depending on the time and season of the year, there are several intern positions that help assist the different processes throughout the unit.

- **Eggs:** The School's poultry division introduced the Omega 3 egg to Greece in 1997 in partnership with Thessaloniki's Aristotle University and other international veterinary and food experts. Today, the Farm annually produces 5.5 million Omega 3 eggs for commercial sale. The intern will participate in on-farm chicken processing, egg processing, and assistance with packaging and labeling of the eggs in order to be marketed and sold. Quality control & daily check-ups of chicken's health will also be an on-going daily practice that students will learn. The internship position is available all year long. (Fall, Spring, Summer)
- **Feed Milling Manufacturing:** Interns will be working through all phases during the feeding manufacturing process by learning how to use the schools specialized machinery. The internship position is available all year long. (Fall, Spring, Summer)
- **Turkeys:** The School introduced fresh turkeys to the Greek market in the 1970s. Today, consumers continue to benefit from the American Farm School's ongoing research programs in poultry nutrition and meat quality. Sold fresh, and only for a limited period, these turkeys earn highest marks with consumers in terms of freshness, appearance, taste and nutritional value. Interns will be working through all phases of the breeding process and learn daily operations for turkey breeder farms. Maneuver cleaning and learning to use various equipment to assist with their growth will also be practiced. The internship position is available during the Fall Term (Sept – Dec).
- **Chick Hatchery:** Interns will perform all necessary duties related to the process of chick-hatching. Interns will develop all the necessary skills such as learning to inspect the eggs the correct way, use the machinery and detect equipment malfunctions. The internship position is available during the Spring Term (Jan – May).

Dairy Unit

The School's Educational Farm is a fully operational dairy farm which serves as a training center for teaching and demonstration in a real life environment. Our areas of focus are dairy reproduction, feeding, housing, veterinary care and milking procedures.

We breed 125 milking cows and approximately 80 heifers and bulls. Bulls are sold to dairy farmers in Greece and are used as breeding nuclei owing to their high genetic value, while heifers are utilized internally to gradually renew our herd. The average milk production is over 10 thousand liters per milking period (305 days). With continuous genetic improvement through artificial insemination and embryo transfer, high quality feed most of which is produced at AFS, and finally due to attentive daily care that ensures optimal "cow comfort", our milk production is more than double the national average.

Interning at our educational farm, being the sole trademark of the school, is extra special.

Below you will find the two major intern positions in our dairy unit.

- **Dairy Farmer:** The intern will be responsible for the daily care and management of dairy cows under the supervision of their supervisors. He/she will be involved in various tasks in order to assure the production of maximum quantities of milk. Some of these tasks include: milking (specific times throughout the day), feeding, administering medication (learn to identify and cure basic cow illnesses), breeding process (take part of the reproduction process via artificial insemination and detecting when the cow is in heat), calving & managing new born calves, and finally cleaning and disinfecting the farm buildings, as well as properly maintaining the milking equipment. The internship position is available all year long. (Fall, Spring, Summer)
- **Dairy Processing:** The intern will be learning all about the processing procedures of various dairy products like milk, butter, yogurt and cheese. Lab analysis and processing of products via dairy technology will be the sole responsibility. All interns will follow proper milk handling procedures when unloading and transferring milk, maintain good manufacturing practices, good laboratory practices and safety procedures according to ISO regulations. The internship position is available all year long. (Fall, Spring, Summer)

Research Internship



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Research Internship

Please find below indicative research topics according to specialization. It is only suggestive and not limited to the below list. If students wish to run their own research project with their own proposed research topic, it is okay to do so as long as it is validated & pre-approved by a Perrotis professor.

Research Interns can choose a topic in the following fields:

1. International Food Business
2. Applied Biological Sciences: Entomology, Public Health, Biology, Ecology, & Genetics
3. Food Science & Technology
4. Environmental Engineering
5. Environmental Science

1. International Food Business

The overall aim of the research projects is to explore the Greek agro food sector's potential in international markets and more specifically in the US market. The proposed research projects are of practical value for the local SMEs/communities in Greece. They address specific needs and are designed in a way that ensures that the findings will have a maximum impact on the sectors' enterprises. Each projects specific objectives, structure and methodology will be determined in collaboration/agreement between the student and their advisors.

- Food Exports and their importance in Greece's economy
- Extroversion-obstacles/challenges for food SMEs
- Opportunities in international markets for Greek food SMEs
- Current food trends in the international markets
- The US food market for Greek products
- Innovation for Greek food SMEs
- The importance of food SMEs for the country's sustainable development
- Organic vs. Commercial Agriculture
- Best Practices in Global Wine Tourism
- The internationalization of wine SMEs in the midst of the economic crisis: pilot case studies from Greece, Albania & FYROM
- An analysis of the perception of Greek food and beverage exporters regarding their export competitive advantages and barriers.

2. Applied Biological Sciences: Entomology, Public Health, Biology, Ecology, and Genetics

The European Biological Control Laboratory of the United States Department of Agriculture (**EBCL** USDA-ARS) operates at the campus of the American Farm School with a large variety of research interests in the fields of entomology, public health, biology, ecology and genetics.

International students are always welcome to participate in research projects at EBCL in order to gain practical experience at a laboratory setting and receive training on the principles of applied biological sciences. Although not a mandatory requirement, visiting students should preferably have a background on agricultural, biological or life sciences, in order to better understand the research interests of our lab.

Potential short research projects will include research topics such as:

- Microscopy and morphological identification of insects
- Principles of molecular biology in the lab - DNA extraction methods, PCR and sequencing analysis
- Use of molecular techniques in identification of insect species
- Phylogenetic analyses of closely related species - evolutionary applications

3. Food Science & Technology

- **Quality of Olive Oil**

Olive oil is an important part of the Mediterranean diet and its production plays a significant role for the Greek agrofood sector. The students that will get involved in the project will perform both chemical and sensorial analysis on different olive oil samples that can be found in the Greek market in order to classify them according to the standards set by the EU legislation.

- **Evaluating the Physicochemical and Sensory Characteristics of table Olives**

The students that will get involved in this project will evaluate the physicochemical properties of table olives and will perform sensory analysis on different samples currently sold in the Greek market.

- **Application of Edible Coatings as a means to extent the Shelf life of Fruits and Vegetables**

Biopolymer based packaging is gaining great interest due to the fact that it is an environmental friendly means of extending the shelf life of different products. The students that will get involved in the project will apply biopolymer based edible coatings on fruit and vegetables and they will measure their physicochemical characteristics as a function of storage period.

- **Application of Antimicrobial Coatings as a means to Prolong the Shelf life of Muscle Foods**

Edible coatings can act as active carriers of antimicrobial compounds and in that respect prolong the shelf life of certain products. The students that will get involved in the project will apply biopolymer based edible coatings containing natural antimicrobial agents such as essential oils on muscle foods and will monitor the growth of spoilage bacteria as a function of storage period.

- **Use of Meat Marinating as a means to control Microbial Growth in Muscle Foods**

Nowadays consumers are more aware regarding food safety and there is an increasing demand for the application of new means aiming in the extent of the shelf food of the different food products. The students that will get involved in the project will marinate meat in marinades containing natural antimicrobial agents and will monitor the growth of spoilage bacteria as a function of storage period.

Another group of students will evaluate the effect of marination on physicochemical and sensorial characteristics of meat.

- **Evaluating the antioxidant potential of commercial jams, juices and marmalades**

Nowadays consumers are more aware of the nutritional benefits of different food products and functional food containing various bioactive compounds such as antioxidants are gaining lots of interest. The students that will get involved in this project will evaluate the level of antioxidant agents and the antioxidant capacity of commercial marmalade and jam products currently sold in the Greek market and will also evaluate some of their physicochemical properties

- **Evaluation of the probiotic character of Greek traditional products such as dairy products, table olives and fermented vegetables**

Probiotic food products are in general fermented foods containing an amount of viable and active microorganisms large enough to reach the intestine and exert an equilibrating action on the intestinal microflora. However, it is of great importance to point out that in order to gain the beneficial effects by the consumption of a food product that contains probiotic bacteria, the recommended daily dose is one billion viable cells. The students that will get involved in this project will evaluate the levels of microorganisms with potential probiotic activity in different traditional Greek products currently sold in the market.

- **Growth Kinetics of Molds**

There is currently limited information on the growth kinetics of various molds in matrices containing different hurdles of relevance for the food sector. The students that will get involved in the project will develop growth kinetic models for a selection of molds that are of interest to the food industry.

- **Effect of antimicrobial agents on the growth of *Penicillium commune***

Fungal presence in food may adversely affect its nutritional value, organoleptic properties, appearance and consumer acceptance. Despite great advances on food production standards, spoilage by fungi is still an issue of concern for the industry. The students that will get involved in this project will evaluate the strain variability of eight *Penicillium commune* strains regarding their resistance against different antimicrobial agents.

4. Environmental Engineering

- **Water Resource Management: The Water Footprint Approach**

The water footprint (<http://waterfootprint.org>) is an assessment that measures the amount of water used to produce each of the goods and services we use. It can be measured for a single process, such as growing rice, for a product, such as a pair of jeans, for the fuel we put in our car, or for an entire multi-national company. The water footprint can also tell us how much water is being consumed by a particular country – or globally – in a specific river basin or from an aquifer. The students could be informed about the water footprint assessment and apply the methodology to estimate the water footprint of various products or services available at the American Farm School of Thessaloniki.

- **Stormwater Management: Rain Gardens**

A rain garden is a planted depression or a hole that allows rainwater runoff from impervious urban areas, like roofs, driveways, walkways, parking lots, and compacted lawn areas, the opportunity to be absorbed. This reduces rain runoff by allowing stormwater to soak into the ground (as opposed to flowing into storm drains and surface waters which causes erosion, water pollution, flooding, and diminished groundwater). They should be designed for specific soils and climates. The purpose of a rain garden is to improve water quality in nearby bodies of water and to ensure that rainwater becomes available for plants as groundwater rather than being sent through stormwater drains straight out to sea. Rain gardens can cut down on the amount of pollution reaching creeks and streams by up to 30%. The students could be informed about the principles, the advantages and restrictions of designing rain gardens and then develop projects aiming at the design of rain gardens at the premises of the American Farm School of Thessaloniki.

- **Wastewater Management, Treatment and Reuse**

The wastewater treatment plant (WWTP) of the AFS is a decentralized processing unit. The main objective of this project is the training of students, in order to acquire expertise in environmental protection and sustainable development through the study the environmental footprint of the WWTP of the AFS and the optimization of its operation. More specifically, the students will focus in specific issues regarding saving of energy and resources through wastewater treatment, reclamation and reuse that refers mainly to the irrigation of crops.

5. Sustainable Agriculture & Environmental Science

There are several opportunities for research projects at the AgroCenter of Perrotis College an organically certified field.

Here is a list of ongoing research programs in sustainable agriculture.

A. Aromatic & Medicinal Plants Research Program

- a. Effect of mulching & irrigation levels on the production of *Echinacea purpurea* & *Echinacea angustifolia*
- b. Organic cultivation of *Echinacea purpurea* & *Echinacea angustifolia*
- c. Evaluation of different mulching materials on the production of aromatic plants

B. Cover crop systems in Organic Agriculture Research Project

- a. Effect of cover crops on weeds, pests and subsequent crop yield
- b. Developing multispecies cover crop mixes for sustainable soil management and weed suppression in organic agriculture.
- c. No-till vegetable production using cover crops
- d. Nutrient cycling and nitrogen contribution of multispecies cover crop mixtures in organic agriculture

C. Vermicomposting Research Project

- a. Construction of a pilot continuous flow vermicomposting reactor system for animal wastes
- b. Composting food residues in urban settings
- c. Vermicomposting olive mill waste from two-phase olive mills
- d. Evaluation of vermicompost as a soil amendment and fertilizer

D. Soil Microbial Inoculant Research Project

- a. Application of PGPR (Plant Growth Promoting Rhizobacteria) in crop production (lettuce, spinach, tomatoes, peppers, etc)
- b. The effect of mycorrhizal inoculants on the production of aromatic and medicinal plants
- c. Effect of the Inoculation of legumes with rhizobium strains on crop growth and yield