

# KATHERINE UPSHAW

- Instructor of Biology -

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## EDUCATION

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- Master of Science in Animal Science**, Kansas State University 08/2021  
 Emphasis in Animal Breeding & Genetics  
 Advisor: Dr. Megan Rolf  
 Thesis: *Genetic abnormalities in Hereford cattle: the detection of vertical fiber hide defect and identification of sequence variants associated with the expression of ocular squamous cell carcinoma*
- Graduate Certificate**, Kansas State University 06/2021  
 Genetics, Genomics, & Biotechnology
- Bachelor of Science in Animal Science**, University of Florida 05/2018  
 Biology Specialization  
 Minor in Business Administration

## TEACHING EXPERIENCE

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**Instructor**, BIO 1500 Biology I: Biological Essentials Fall 2022  
 Florida Southern College  
 Students Enrolled: 69

### Responsibilities

- Developed syllabus and created course page on university LMS (Canvas)
- Facilitated discussion of class topics among students of diverse backgrounds

### Teaching Evaluation Results

- Section A: *in progress*
- Section B: *in progress*

**Instructor**, BIO 1500L Biology I: Biological Essentials Laboratory Fall 2022  
 Florida Southern College  
 Students Enrolled: 45

### Responsibilities

- Developed syllabus and created course page on university LMS (Canvas)
- Mentored and supervised teaching assistants during laboratory sessions
- Instilled critical thinking skills and safe laboratory practices in students

### Teaching Evaluation Results

- Section A: *in progress*
- Section B: *in progress*
- Section C: *in progress*

**Instructor**, BIO 1000 Biology For Your Life  
 Florida Southern College  
 Students Enrolled: 29

Fall 2022

Responsibilities

- Developed syllabus and created course page on university LMS (Canvas)
- Designed course structure, assessments, and engaged learning activities
- Facilitated discussion of class topics among students of diverse backgrounds

Teaching Evaluation Results

- Section A: *in progress*

**Instructor**, ASI 107 Companion Animal and Horse Lab  
 Kansas State University  
 Students Enrolled: 140 (Fall 2020), 102 (Spring 2021)

*Fall 2020 - Spring 2021*

Responsibilities

- Developed course syllabus in collaboration with other departmental faculty
- Designed, prepared, and recorded lectures for hybrid instruction
- Implemented novel lab activity to promote experiential learning
- Ensured student safety when working around live animals
- Mentored and supervised teaching assistants during laboratory sessions
- Facilitated discussion of class topics among students of diverse backgrounds

Teaching Evaluation Results for "Overall Effectiveness as a Teacher"

<u>Section</u>	<u>Fall 2020</u>	<u>Spring 2021</u>
▪ Section A:	4.7/5.0	4.6/5.0
▪ Section B:	4.8/5.0	4.7/5.0
▪ Section C:	5.0/5.0	4.5/5.0
▪ Section D:	4.8/5.0	n/a

**Graduate Teaching Assistant**, ASI 600 Applied Animal Biotechnology  
 Kansas State University  
 Primary Instructor: Dr. David Grieger  
 Students Enrolled: 25

*Spring 2020*

Responsibilities

- Delivered guest lecture on *An Introduction to Molecular Biotechnology*
- Provided constructive input in the design of lectures and assessments
- Scored student assessments, provided relevant feedback, and recorded grades
- Taught standard molecular laboratory techniques, including primer design, DNA extractions, PCR, gel electrophoresis, and protein assays (Pierce BCA)

**Graduate Teaching Assistant**, ASI 210 Introduction to Biotechnology  
 Kansas State University  
 Primary Instructor: Dr. David Grieger  
 Students Enrolled: 45

*Fall 2019*

Responsibilities

- Organized and presented supplemental review sessions for students
- Assessed student mastery of course material and maintained grade records
- Performed animal phlebotomy, DNA extractions, PCR, and gel electrophoresis

**Graduate Teaching Assistant, ASI 600 Applied Animal Biotechnology***Spring 2019*

Kansas State University

Primary Instructor: Dr. David Grieger

Students Enrolled: 18

## Responsibilities

- Delivered guest lecture on *Molecular Genetics and Biotechnology*
- Implemented novel assignments and contributed questions for exams
- Demonstrated expertise in laboratory safety and furthered my technical skills
- Trained students to perform PCR, DNA extractions, and gel electrophoresis

**Graduate Teaching Assistant, ASI 500 Genetics***Fall 2018*

Kansas State University

Primary Instructor: Dr. Megan Rolf

Students Enrolled: 74

## Responsibilities

- Provided weekly review sessions to enhance understanding of course topics
- Developed interactive worksheets and practice problems for students
- Scored student assignments, proctored exams, and maintained grade records

**Undergraduate Teaching Assistant, ANS 3384C Domestic Animal Genetics***Spring 2017*

University of Florida

Primary Instructor: Dr. Raluca Mateescu

Students Enrolled: 100

## Responsibilities

- Supervised and tutored undergraduates during in-class assignments
- Assessed student comprehension by proctoring and grading exams

## RESEARCH EXPERIENCE

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**Graduate Research Assistant**, ASI Beef Genetics Lab  
Kansas State University  
PI: Dr. Megan Rolf

08/2018 - 08/2021

**Project: Bovine Ocular Squamous Cell Carcinoma (BOSCC)**

Research Objective: Identify regions of the genome that are most highly associated with the expression of BOSCC

Responsibilities

- Compiled phenotypic data and organized hair cards from 567 Hereford cattle
- Extracted DNA from over 550 hair samples following a silica-membrane-based nucleic acid purification approach
- Evaluated DNA for adequate concentration and A260/A280 ratios prior to genotyping on a 777k SNP chip
- Employed pooled genotyping to reduce costs and maintain statistical power
- Analyzed significant QTL for SNP effects and potential candidate genes

**Project: Vertical Fiber Hide Defect (VFHD)**

Research Objective: Obtain modern estimate of VFHD incidence in American Hereford cattle and offer insight into using genomics to manage VFHD

Responsibilities

- Coordinated biopsy sample collection from live cattle with a team of graduate students, university faculty, and veterinarians
- Upheld animal welfare standards by completing relevant training and following IACUC-approved protocols, including post-op animal monitoring
- Prepared biopsies for histological analysis by collecting, mounting, and staining samples, followed by microscopic evaluation
- Maintained thorough records of SOP and SDS forms for lab chemicals

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**Undergraduate Research Assistant**, Choe Lab  
University of Florida  
PI: Dr. Keith Choe

01/2018 - 05/2018

**Project: Molecular and Genetic Responses to Environmental Stress**

Research Objective: Investigate genetic factors influencing the physiological response of *Caenorhabditis elegans* to environments of differing osmolarities

Responsibilities

- Developed experiments to evaluate *C. elegans*' genetic response to hyper- and hypotonic environments
- Examined the role of *Tag-344* and *pgp-8* genes in the environmental adaptation mechanisms of *C. elegans*
- Designed primers, identified gene structure, and evaluated mRNA abundance to identify differential tissue expression
- Performed real-time RT-qPCR and evaluated melt curve data to quantify relative mRNA expression

## PUBLICATIONS

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- 2021 **Upshaw, K.**, Butler, M., Henderson, J., Shaffer, W., & Rolf, M. (2021). Utilization of genomic testing for the selection of desirable traits in cattle. In R. M. Hopper (Ed.), *Bovine Reproduction* (2nd ed., pp. 949-977). Wiley-Blackwell Publishing. doi: 10.1002/9781119602484.ch76
- 2021 Dameron, P., **Upshaw, K.**, McDanel, T., Keele, J., Kuehn, L., Weaber, R., Bormann, J., & Rolf, M. (2021). Identification of SNPs associated with cancer eye in Hereford cattle. *Spring 2021 Undergraduate Research Symposium*, 11 May.
- 2020 **Upshaw, K.** (2020). Collagen Disorders in Livestock Hide. *Beef Improvement Federation 52nd Annual Research Symposium and Annual Meeting*, 8-12 June.
- 2019 Scolaro, G., ..., **Upshaw, K.**, et al. (2019). Increased expression of *pgph-1*, T23F2.4, and *cyp-14A5* in *C. elegans dpy-7* mutants and by high salt. *microPublication Biology*. doi: 10.17912/micropub.biology.000136

## HONORS & AWARDS

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- Graduate Teaching Assistantship**, Kansas State University 08/2020 - 05/2021  
Animal Breeding & Genetics
- Graduate Research Assistantship**, Kansas State University 08/2018 - 08/2020  
Animal Breeding & Genetics
- 2020 Baker/Cundiff Scholarship Winner**, Beef Improvement Federation 06/2020  
Awarded at the BIF 52nd Annual Research Symposium and Annual Meeting

## PROFESSIONAL DEVELOPMENT

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- Teaching & Learning Center Professional Development Series Attendee** 2018 - 2021  
Kansas State University, Manhattan, KS
- 108th Cattlemen's Day Attendee** 03/2021  
Kansas State University, Manhattan, KS
- 52nd BIF Research Symposium and Convention Award Winner** 06/2020  
Beef Improvement Federation
- Certification: Teaching in University Science Laboratories** 05/2020  
University of Amsterdam
- Certification: Basics of Inclusive Design for Online Education** 04/2020  
University of Colorado
- Certification: Philosophy, Science, and Religion** 03/2020  
The University of Edinburgh
- Certification: Beef Quality Assurance: Cow/Calf Option** 03/2020  
National Cattlemen's Beef Association

<b>107th Cattlemen's Day Volunteer</b> Kansas State University, Manhattan, KS	03/2020
<b>NBCEC Brown Bagger Seminar Series Attendee</b> National Beef Cattle Evaluation Consortium	2018 - 2020
<b>106th Cattlemen's Day Volunteer</b> Kansas State University, Manhattan, KS	03/2019
<b>51st BIF Research Symposium and Convention Attendee</b> Beef Improvement Federation, Brookings, SD	06/2019
<b>11th BIF Genetic Prediction Workshop Attendee</b> Beef Improvement Federation, Kansas City, MO	12/2018
<b>Certification: Responsible Conduct of Research Training</b> CITI Program	09/2018
<b>Certification: Institutional Animal Care and Use Committee Training</b> CITI Program	09/2018
<b>Certification: Artificial Insemination Management</b> ABS Global, Inc., Bell, FL	02/2018
<b>Ecole d'Ingénieurs de Purpan Program Pre-Veterinary Intern</b> SCP Veterinaire Seguin Decante Audureau, Banassac, France	06/2016 - 07/2016

## **EXTRACURRICULAR ACTIVITIES & LEADERSHIP**

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<b>Member of ASI GSA</b> , Kansas State University, Manhattan, KS Animal Sciences and Industry Graduate Student Association	08/2018 - 08/2021
<ul style="list-style-type: none"> <li>▪ Served as President 01/2020 - 05/2020</li> <li>▪ Served as Vice President 09/2019 - 12/2019</li> <li>▪ Served as Secretary/Treasurer 09/2018 - 08/2019</li> </ul>	
<b>Research Mentor</b> , Kansas State University, Manhattan, KS Animal Breeding and Genetics Lab	01/2021 - 05/2021
<ul style="list-style-type: none"> <li>▪ Mentored undergraduate students to perform basic laboratory techniques and statistical analyses of genetics-based research projects</li> <li>▪ Trained an undergraduate student to fully develop, execute, evaluate, and present results of a genome-wide association study</li> </ul>	
<b>Lab Station Lead</b> , Kansas State University, Manhattan, KS Animal Sciences Academic Quadrathlon	02/2021
<ul style="list-style-type: none"> <li>▪ Created two lab science-based stations for quadrathlon teams to complete</li> <li>▪ Supervised multiple teams simultaneously at each station</li> <li>▪ Scored team performances and submitted final ranking to event coordinator</li> </ul>	

## RELEVANT SKILLS

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### Teaching & Curriculum Development

- Exceptional oral and written communication skills
- Experienced in creating course syllabi, lectures, assignments, and activities
- Proficient in facilitating multimedia student engagement

### Technological Instruction

- Experienced in multiple LMS (Canvas: 7 years, Blackboard: 2 years)
- Adept at delivering engaging and inclusive course content via hybrid instruction
- Proficient at video recording and editing software (Mediasite, Bandicut, Bandicam)

### Laboratory Techniques

- 3+ years of biology lab experience
- Basic bench skills: pipetting, microscopy, centrifugation, recordkeeping, analysis
- Genetics: DNA extraction, PCR, gel electrophoresis
- Histology: fixation, embedding, cryosectioning, staining
- Microbiology: aseptic technique, Gram stains, serial dilutions, culture transfers

### Computer Programs

- Statistical Analysis: R, SAS, PLINK
- Telecommunication: Zoom, Skype, MS Teams
- Microsoft Office Suite: Word, Excel, PowerPoint, Outlook, Publisher, OneDrive

### Animal Handling

- 10+ years of professional small animal handling experience
- 7 years of large animal handling experience
- Skilled in animal phlebotomy and delivering subQ and IM injections

### Collaboration & Leadership

- 2 years of experience as an officer of the ASI Graduate Student Association
- Trained undergraduates to conduct genetics-based research projects
- Led team of graduate students and faculty to write a genomics textbook chapter

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Learning is a process that does not start nor end within the walls of a classroom. Students continually learn from professors, peers, and society. As an instructor, I guide students in the learning process to think critically about the world around them and be able to cogently articulate their views with others. On its most superficial level, teaching involves conveying subject knowledge, but this method of teaching alone is not conducive to learning. Teaching should include real-world applications, experiences, and discussions to aid students in interpreting the news and information that they are inundated with on a daily basis. I believe this is especially true in science and as Carl Sagan once said, "Science is a way of thinking, much more than it is a body of knowledge." My success as a science teacher results from my ability to empower students to learn through student engagement, student accessibility, and student collaboration.

One of the core principles of my teaching philosophy is being able to cultivate student engagement. Although traditional lectures are useful for presenting information, they can become tedious very quickly. To mitigate this issue, I intersperse active learning techniques that involve students in the learning process. I regularly stop to discuss important, difficult, or controversial concepts with the class, which not only provides students a chance to reflect over the material but also an opportunity to develop scientific rationale. Students are further engaged when they see examples of how science affects and enriches their lives beyond the classroom, so I purposefully design my lectures to include real-world applications.

Students who are engaged in the course material are ready to learn, but it is equally important to ensure that students are given the same opportunities to learn. Classrooms are diverse microcosms full of individuals with different interests, educational backgrounds, cultural upbringings, and life experiences. Thus, I value curriculum design decisions that highlight a universal design for learning. My course materials provide students multiple ways to acquire information and demonstrate what they have learned. Lecture notes and supplemental resources are made available in class and online via the university LMS. Additionally, assessments include multiple-choice, short-answer, and matching questions. Students do not all learn the same way, but I believe that it is my responsibility to provide them with equal opportunities to learn.

Facilitating student collaboration is another essential aspect to the learning process. Collaborative learning is valuable for students because it promotes teamwork and communication skills. Inter-student collaboration fosters relationships that may benefit the student in future endeavors. I enjoy discussing challenging concepts with my students as a method of increasing student engagement, but in larger classes, I find that it is advantageous to pair students up to contribute to the discussion in groups. Being able to communicate scientific concepts eloquently and rationally is a crucial skill in the modern era. One of the core benefits of collaborative work is creating an intellectually rewarding environment in which students with different skills and knowledge come together to engage in shared learning.

Ultimately, I believe learning is a lifelong process for everyone, including teachers. I am always seeking new professional development opportunities to improve my courses and myself for my students. Learning is not something that ends with the semester, but rather, a constant series of personal and professional growth that goes far beyond my classroom. My goal is to enrich students' lives with scientific knowledge and lifelong skills, like critical thinking and communication, through engagement, accessibility, and collaboration. I continually look forward to teaching and learning from the exceptional students at Florida Southern College.