

Geography 5420/6420- Pollen Analysis

Fall 2020

Meets: GC 5825, Friday / 11:50AM-02:50PM (Except September 28-October 2, October 5-10, and November 30-December 3, when it will be on line in Canvas)

Professor: Dr. Kenneth Petersen

Email: ken.petersen@utah.edu

Home phone 801-466-3671

Virtual Office Hrs: Thursday 12-4 pm, by calling my home phone 801-466-3671; or by appointment.

Course web-site on Utah.instructure.com

Textbooks: *Textbook of Pollen Analysis* by Faegri and Iversen 4th Ed. (selected chapters will be posted)

Kapp's Pollen and Spores (go to <https://palynologyshop.org/product-category/aasp-foundation-books/>

follow instructions for purchase - \$30.00 + \$10.00 shipping).

Univeristy of Utah Covid 19 Required Guidance

o **Face coverings are required in all in-person classes for both students AND faculty.**

• Based on CDC guidelines, the University requires everyone to wear face coverings in shared public spaces on campus, including our classroom. As a reminder, when I wear a face covering, I am protecting you. When you wear a face covering, you are protecting me and all of your classmates. If you forget your face covering, I will ask you to leave class to retrieve it. If you repeatedly fail to wear a face covering in class, I will refer you to the Dean of Students for a possible violation of the Student Code. Note that some students may qualify for accommodations through the Americans with Disabilities Act (ADA). If you think you meet these criteria and desire an exception to the face covering policy, contact the [Center for Disability and Access](#) (CDA). Accommodations should be obtained prior to the first day of class so that I am notified by CDA of any students who are not required to wear a face covering.

o **Please note that face shields alone are not an acceptable form of face covering unless also worn with a covering or mask for the nose and mouth.**

o **Please practice appropriate personal hygiene to reduce transmission of the virus, including:**

• Wash your hands, use hand sanitizer and clean your desks with wipes, which will be available at the classroom entrance.

• **Because in-class attendance is a necessary component of this course because it is a hands-on laboratories course, please note the follow:** Given the nature of this course, attendance is required and adjustments cannot be granted to allow non-attendance. However, if you need to seek an ADA accommodation to request an exception to this attendance policy due to a disability, please contact the [Center for Disability and Access](#) (CDA). CDA will work with us to determine what, if any, ADA accommodations are reasonable and appropriate.

• **The university is asking students, faculty and staff to stay home if they are sick.** Additionally, follow university [employee exposure guidance](#). The list of symptoms for COVID-19 is available on the [CDC website](#).

o **Please familiarize yourself with Canvas..** The [Canvas Getting Started Guide for Students](#) can be helpful.

o **You must self-report if they test positive for COVID-19** via this website: <https://coronavirus.utah.edu/>.

o **During the weeks of September 28-October 2, October 5-10, and November 30-December 3**, all University lasses will be online. See class schedules for specifics.

o **All class materials can be accessed online through Canvas.**

o Research laboratory protocols, as described by the Office of the Vice President for Research, generally apply to our laboratory:

§ **Students in instructional laboratories must wear face covering.**

§ Students should sanitize laboratory workstations before beginning work.

§ Movement in and out of labs and studios to obtain materials or equipment should be minimized during the activity. Ideally, all needed materials should be available in the room at the beginning of the period.

§ Gloves and sanitizers will be provided in every laboratory.

§ Disposable face coverings should be available if the laboratory involves use of hazardous material.

§ Please sit in the same place for each class. A seating chart will made to simplify contact tracing should any student become infected.

Course Objectives

We are going to learn many interesting things about pollen in this class, but the main objectives of the course include learning: 1) how to use a microscope, 2) what pollen is and it's scientific significance, 3) what pollen looks like, 4) the terminology to describe the sculpturing and structure of a pollen grain, and 5) how to identify pollen grains to the lowest taxonomic level.

Course Format

We will spend the first ~30-45 minutes discussing the reading assignment for that day. The rest of the class period will be spent on the microscopes learning the pollen type of that day. We only have our class time on these microscopes, so be sure to attend every class and take advantage of the all the time we have available. There will be no make-up labs. We have the lab until 2:50 pm each Friday, we recommend using all the time in the lab since we will not have access any other times.

Class Policies

Reading assignments are expected to be completed before class and at the beginning of each class there will be a quiz over the reading assignment, the previous lecture, or the pollen types studies thus far will. There are NO make-up quizzes, however your lowest score will be dropped.

There will be two in-class exams. As we have very limited access to the microscopes, these cannot be made up. On the days of the exam, class will start at 1 am so there will be time to set up the microscopes beforehand.

You are responsible for all information presented in class and over the course website on Utah.instructure.com. Graduate students will be held to a higher standard on the exams and on the synthesis project.

Grading

2 Exams	35% each
Participation	15%
Synthesis Project	15%

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD) to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

ACADEMIC MISCONDUCT SYLLABUS STATEMENT

- * Academic misconduct will not be tolerated. Penalties may include failure of an assignment, the entire course, and/or the filing of formal charges with appropriate university authorities. Academic misconduct includes, but is not limited to, cheating, misrepresenting one's work, and plagiarism:
- * Cheating involves the unauthorized possession or use of information in an academic exercise, including unauthorized communication with another person during an exercise such as an examination.
- * Misrepresenting one's work includes, but is not limited to, representing material prepared by another as one's own work or submitting the same work in more than one course without prior permission of all instructors.
- * Plagiarism means the intentional unacknowledged use or incorporation of any other person's work in one's own work offered for academic consideration or public presentation.

Syllabus (subject to change, regularly check the course website for up-to-date information)

<u>Week</u>	<u>Day</u>	<u>Topic</u>	<u>Chapter</u>
1	8/28	Syllabus, introduction, Microscope use, common name assignment	
2	9/04	Microscope Use Continued Sculpture & Structure Common name assignment due	Faegri Chapt part 11.3.3-11.6 p.217-236
3	9/11	A little history, Pollen Biology	Faegri Chapt 1, Chapt 9 (Jansonius volume 1)
4	9/18	Production and Dispersal, Review	Faegri Chapter 2
5	9/25	EXAM I in class	
6	10/02	Discussion of Synthesis project (Canvas on line)	
7	10/09	Where Pollen is Found (Canvas on line) Synthesis project description due	Faegri Chapter 3
8	10/16	New Frontiers in Palynology	Chapter 23 (Jansonius volume 3)
9	10/23	New Frontiers in Palynology (continued)	
10	10/30	Fossil studies & Presenting pollen data	readings posted on Canvas
11	11/06	Archaeology and Pollen	readings posted on Canvas
12	11/13	Review	
13	11/20	FNIAL EXAM II in class	

Synthesis project due on December 11 by 5:00 p.m. submitted via Canvas. No exceptions.

POLLEN SET 1

Vesiculate grains

Inaperturate

Monoporate

Triporate

POLLEN SET 2

Periporate

Stephanoporate

Monocolpate

Tricolpate

Polyplicate

Tetrads

Tricolporate

Heterocolporate

Cool and Helpful Websites (with pictures!)

<http://www.geo.arizona.edu/palynology/>

<http://www.paldat.org/>

<http://apsa.anu.edu.au/>

<http://www.geog.qmul.ac.uk/popweb/default.htm>

Synthesis Project Description:

There are two options for the synthesis project. One option is to work up material from a site that is relevant to your research interests. The other is to evaluate some palynological literature from a topic area that is interesting to you.

Option 1 (recommended for graduate students):

You are expected to count 3 slides from your selected site. How many slides will be decided individually based on the difficulty of the material and abundance of pollen. Each count will be to a total of at least 300 terrestrial grains, however each person should discuss their counts with Ken to confirm a suitable total count.

Logistics: Work with Andrea Brunelle or Mitch Powers to work out how to get pollen slides. Then we suggest you work on one slide in class and one in the lab. You will need to use the same microscope each time so that you can keep track of your transects. Keep a list of all the taxa you encounter with the number of times you see them for each slide. Once you know the general list of taxa you will encounter, you can type up a "count sheet" that you can use for future counts. Taxa vary from site to site there is no universal sheet to use.

What you will turn in:

- A spreadsheet with your pollen count data for your 2-3 slides.
- A graph of your data
- A ~5 page report (not including references) that describes your site (modern), the research questions being asked (what you hope to answer with your pollen data), the climatic/environmental significance of the taxa that were abundant at your site, and what changes you noted between your 2-3 slides and what they might mean.

We are not expecting results worthy of publication from your three slide count. The counts themselves are the major component; it will be very useful to learn how to count fossil material. We do want to see in your report that you have done some research on the climatic/environmental significance of your taxa (cited appropriately), and that if there are changes in abundance, you have thought about what they might mean.

Do not wait to get started! Once you get the hang of it, you will likely be counting a sample in 3-5 hours. However, in the beginning it can take several days to get through one slide. You will then need time to generate a graph and write up, which while not long, will take a bit of research plus time to write (and PROOFREAD). It should be typed, and please get someone to read it for you for feedback before you hand it in.

Option 2 (recommended for undergraduates):

Select a topic interesting to you and write short research paper on it. I would like you to include at least 8 peer-reviewed papers on the topic and the report must include specific discussion of at least 3 pollen diagrams/pollen data presentations.

The paper should be 8-10 pages long (double spaced) not including the references or figures. PROOFREAD your paper.

Some possible topics include: forensic palynology (how can pollen be used to solve crimes), pollen from archaeological contexts, melissopalynology (honey), allergenic palynology, palynology from a specific geographic region (e.g. the palynological history of Costa Rica), pollen from ice cores, etc.