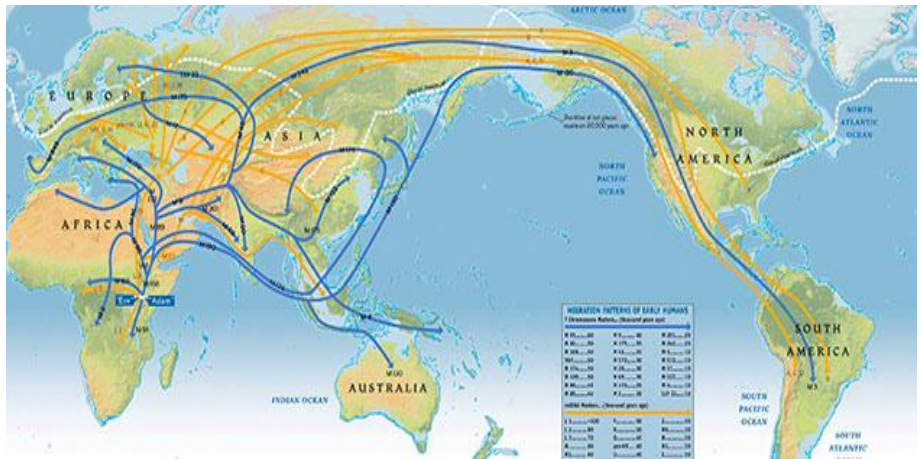


Archaeology 305: Human Variation and Adaptation (Winter 2013)



Human Genographic Project (human migrations mapped with genes)

Professor: Warren Wilson

Tel.: 220-2665

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Lecture: TR 12:30-1:45, A 132

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Office hours: Weds. 1:00-3:00 *and* by appointment

Course Description

In *Natural History*, Roman scientific writer Pliny the Elder remarked that, although human countenance is made up of only “ten parts or a little more,” people were so fashioned that “among the many thousands no two exist who cannot be distinguished.” How are we to explain this rich multiplicity of human physical forms? Anthropology can assist us in our efforts to answer this question. Indeed, the discipline of anthropology investigates the nature and causes of human variation as well as those aspects of life that are common to all of humanity. The anthropological sub-discipline, biological anthropology is concerned with human biology and focuses specifically on human biological variation. Utilizing a biological anthropology perspective, the goal of this course is to introduce you to the scientific study of human variation. We will begin with a consideration of the origins and impacts of the concept of race and follow this with an overview of the scientific method and the anthropological approach to the study of human biological diversity. We will then cover the biological bases of human variation in discussions of genes in human populations, the heritability of traits, and population genetics. In the latter part of the course we will look at human variation as the outcome of adaptation to a variety of environmental factors. This course should help you to understand the biology underlying the variation of human physical and psychic forms and to sort fact from fiction in the contentious and clouded debates over human variation.

Course Conventions

1. Lecture: In order to meet the goals of the course you have to come regularly to class and ON TIME. Be prepared by reading what is assigned for the day. You are responsible for lecture material and any announcements concerning changes in schedule, etc. Please note that lectures are not a summary of the material presented in the text and that, on the balance, exam questions will be drawn from material emphasized in lecture. The use of computers, cell phones, or other personal electronic devices in the classroom is not permitted.

2. Prerequisites: While I will briefly cover molecular genetics and the inheritance of simple (Mendelian) traits, you should have a basic understanding of these topics prior to taking this course. If you are concerned about this, please see or contact me during the first week of classes.

3. Reading: reading assignments will be found both in the text book, Kormondy & Brown, 1998. *Fundamentals of Human Ecology*, the reserve reading room in the library, and online in the “Course Documents” section of the class Blackboard site. In addition to the required readings, there are several recommended readings. The recommended readings are provided to enhance your knowledge of the subject in question. Keep in mind that *you are not finished with the reading assignment until you thoroughly understand it*. This will sometimes require you to read an assignment more than once. An effective way of ensuring comprehension is to read the assignment then go back through it and summarize its main points in your notebook.

4. Evaluation: You will be evaluated based on your performance on **three mid-term exams** (multiple choice and short answer). Prior to each exam I will hand out a list of key terms and concepts that will be covered on the exams. In preparing for each exam, you should not define each key term in isolation; rather, define and understand it in relation to the other key terms within the context of the course.

You must provide advance notice to me if you are unable to take an exam. All requests for deferral of an examination due to health reasons must be accompanied by written documentation as outlined in the University Calendar and should be obtained while the student has the physical or emotional problem rather than after recovery. Deferred exams may be allowed in the following circumstances: illness, domestic affliction or religious conviction. If you have missed an exam for a legitimate reason, you will be able to write a “make up” exam as close to the original exam as possible. The date and location will be at the convenience of the Archaeology Department. Travel arrangements and misreading of the syllabus are **not** valid reasons for requesting a deferred exam. Deferred exams and take-home, short-answer questions will be granted only if it is determined that just cause is shown by the student.

Please note that requests to defer term work past the end of a term go through the Program Information Office (PIC) and must be processed by the deadlines that are established in the U. of C. Calendar. You can find the forms you need at: Deferred Term Work Form: <http://www.ucalgary.ca/registrar/files/registrar/defTW.pdf> . You must submit these deferral forms to the Arts Associate Dean (Students) through the PIC office: Program Information Centre, main floor, Social Sciences Building Room 102. To make an appointment with the Associate Dean, phone (403) 220-8155. Only the Associate Dean approves requests for deferrals which extend beyond the end of a term. Instructors are not involved in such decisions.

Your final grade will be calculated as follows:

Mid-Term Exam #1:	_____	42%
Mid-Term Exam #2:	_____	48%
Mid-Term Exam #3:	_____	10%

Letter grade assignment: At the end of the course, the numerical marks will be summed and a final letter grade will be assigned based on the following basis:

Percentage range	Letter grade	Percentage range	Letter grade
95 or higher	A+	68-72	C+
90-94	A	64-67	C
85-89	A-	59-63	C-
81-84	B+	54-58	D+
77-80	B	50-53	D
73-76	B-	49 or lower	F

5. Retrieving Assignments: The Freedom of Information and Protection of Privacy (FOIP) legislation disallows the practice of having students retrieve assignments from a public place, e.g., outside an instructor’s office or the Department main office. Term assignments must be returned to students individually, during class, or during the instructor’s office hours; if a student is unable to pick up her/his assignment s/he may provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment.

6. Office Hours: I enjoy having visitors during my office hours and am happy to schedule additional times as necessary. These hours are yours and I encourage you to take advantage of them, whether you are having difficulty with some aspect of the course, or if you would like to discuss in greater detail something that was touched on in class.

7. E-mail: Students are encouraged to use the lectures and office hours to ask questions. For after-hours questions, the use of email is acceptable. Please write ‘ARKY 305’ in the ‘Subject’ portion of the email. The instructor receives numerous e-mails every day. By clearly identifying the subject of your email, you will help me reply more efficiently to your emails. If the instructor thinks that your question and related answer is of general interest, he may decide to post them on the course Blackboard space (your name will not appear). Note that while I will do my best to reply to your message as soon as possible I will generally not be able to do so on weekends or holidays. Overall, I attempt to reply to all messages within four days.

8. Writing across the Curriculum: Writing skills are not exclusive to English courses and, in fact, should cross all disciplines. The University supports the belief that throughout their University careers, students should be taught how to write well so that when they graduate their writing abilities will be far above the minimal standards required at entrance. Consistent with this belief, students are expected to do a substantial amount of writing in their University courses and, where appropriate, instructors can and may use writing and the grading thereof as a factor in the evaluation of student work. The services provided by the Writing Centre in the Effective Writing Office can be utilized by all undergraduate and graduate students who feel they require further assistance.

9. Academic Accommodation Policy: The purpose of academic accommodation is to provide students with documented disabilities equal opportunity to master the essentials of a post-secondary education. Students with disabilities at the University of Calgary have met all admission requirements but may have done so with the use of accommodations. Similarly, they are expected to meet all academic and non-academic requirements. Adaptive technology and other academic accommodations do not relieve students of their responsibility to develop the essential skills and abilities expected of all students.

10. Disability Resource Centre Accommodations: It is the responsibility of the student to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at (403)220-8237. Please refer to the following web link for detailed information: <http://www.ucalgary.ca/drc/node/71>

Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. Students are also required to discuss their needs with the instructor no later than fourteen (14) days after the start of the course.

12. Electronic devices: Students in this course are not allowed to use any portable electronic devices, other than a calculator, in class.

Schedule¹

Date			Topic	Readings ^{2*}
1	Jan.	8	hate crimes, anthropology, science as a way of knowing	Sagan (Scientists' Tools), CBC hate crimes reading, Kristof
2	Jan.	10	History of the race concept: Morton, Social Darwinism, origins of the race concept	Marks (Black, White.); Culotta (Roots of Racism) and <i>either</i> Akpan <i>or</i> Wiesel
3	Jan.	15	History of the race concept: Linnaeus, Buffon & Physical Anthropology, History of the race concept?	SSRC (Is Race Real?), Bauer (2007) (<i>optional</i>) & Blumenthal (2009) (<i>optional</i>)
4	Jan.	17	History of the race concept: Why the rejection of race concept?	Ehrlich & Holm (Bio. View of Race), Milgram (<i>optional</i>), Stanford Prison Experiment (<i>optional</i>), Barujani et al. (<i>optional</i>), Disotell (<i>optional</i>)
5	Jan.	22	Genetic variation: human genetic diversity & sources of genetic variation	Cummings (Mutation); Lewis (Extensions & Exceptions); Informed consent for genetics testing, NPR - New Genetic Test..., NPR- Ethics of Genetic Tests..., US-Venezuela (Huntington's onset) (<i>optional</i>)
6	Jan.	24	Patterns of Inheritance: simple & complex traits	Groopman (Decoding Destiny); Lewis (Complex Traits)
7	Jan.	29	Complex traits: IQ, intelligence & heritability	Jones (Calliban's Revenge)
8	Jan.	31	Complex traits: IQ, intelligence & heritability	Lewontin (Mental Traits)
9	Feb.	5	Complex traits: sex determination	Gonzalez et al. (Sex & Genetics), Fausto-Sterling (5 Sexes), NOVA-How is sex determined?, Is the Y Chromosome Doomed? (<i>optional</i>)
10	Feb.	7	Mid-Term Exam #1	
11	Feb.	12	Complex traits: gender roles	NPR – "What if your child..." & Padawar (<i>optional</i>), Minto (<i>optional</i>)
12	Feb.	14	Complex traits: gender roles	Dreger (Is Anatomy Destiny?), Women & Mental Illness (<i>optional</i>)
--	Feb. 19-	21	Reading Break – no classes	
13	Feb.	26	Human population biology: origins, theory, levels of adaptation	K & B ³ Ch. 1 & 6
14	Feb.	28	Climatic stress & human variation: solar stress, thermal stress	Loomis
15	Mar.	5	Climatic stress & human variation: thermal stress (cont.)	K & B Pp. 131—149
16	Mar.	7	Adaptation to thermal stress: heat and cold	K & B Pp. 149—161
17	Mar.	12	Adaptation to malnutrition: requirements	K & B Pp. 186—202, Nutrition Handout, UNICEF (see summary indicators on p. 95)
18	Mar.	14	<i>Remembrance Day / Reading Days (no class)</i>	
19	Mar.	19	Adaptation to malnutrition: variation in susceptibility to starvation	K & B Pp. 202-204; Brown & Konner (Anthro & Obesity)
20	Mar.	21	Adaptation to Hypoxia	K & B Pp. 162-173 & Hypoxia Handout (Beall's work)
21	Mar.	26	Mid-Term Exam #2	
22	Mar.	28	Adaptation to Infectious Disease	K & B pp. 204-224 & TBD
23	Apr.	2	Adaptation to Infectious Disease	Dugger & McNeil (Polio), Kolata (plaque & HIV)
24	Apr.	4	Population Ecology: terms & concepts in demography	K & B Ch. 4
25	Apr.	9	Population Ecology: 4 evolutions in pop. growth, HIV & pop. growth rate	K & B Ch. 5

Schedule (cont.)¹

	Date	Topic	Readings ^{2*}
26	Apr. 11	Population Ecology: demographic transition.	This American Life (podcast): "Words"
27	Apr. 16	Mid-Term Exam #3	

¹ The schedule of topics may change, but the exam dates will not.

² For a detailed bibliography of the readings, please see pages 7—9 below. The reading assignments are subject to change should I find, during the present semester, more recent publications which better cover the topic considered. If this occurs, I will inform you no later than 2 weeks prior to the relevant class.

³ K & B = Kormondy & Brown's *Fundamentals of Human Ecology*.

Readings

Some readings are available as pdfs on the Blackboard site, some only in the McKimmie Library Reserve Reading Room, and others online. Note, this bibliography does NOT include readings from the Kormondy and Brown text.

Akpan, Uwem (2008) *Say You're One of Them*. Hachette Book Group. New York. (While the entire book is appropriate for this course, the reading assignment only covers the book's last chapter: "My Parent's Bedroom"). (pdf posted on Blackboard)

Barbujani et al. (1997) An apportionment of human DNA diversity. *Proceedings of the National Academy of Sciences* 94:4516-4519. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC20754/>

Bauer (2006) On the Holocaust and Other Genocides. United States Holocaust Memorial Museum. <http://www.ushmm.org/research/center/publications/occasional/2007-03/paper.pdf>

This paper and the paper below by Blumenthal were presented at the United States Holocaust Memorial Museum. It can be found as a podcast on iTunes via the United States Holocaust Memorial Museum link. For further talks on genocides around the globe, please visit the museum's Voices on Genocide Prevention Podcast (<http://blogs.ushmm.org/COC2/C9/P0/>).

Blumenthal (2009) How Might Another Holocaust be Prevented. United States Holocaust Memorial Museum. <http://www.js.emory.edu/BLUMENTHAL/Hol%20Prevention.htm>

Brown, P.J. and M. Konner. 1987. An anthropological perspective on obesity. *Annals of the New York Academy of Sciences*. Vol. 499. Pp. 29-46. <http://onlinelibrary.wiley.com.ezproxy.lib.ucalgary.ca/doi/10.1111/j.1749-6632.1987.tb36195.x/pdf>

CBC News Online. 2004. Indepth: Hate Crimes – What is a hate crime? <http://www.cbc.ca/news/canada/story/2011/06/15/f-hate-crimes.html>

Culotta, E. 2012. Roots of Racism. *Science*. 336:825-827. (access via E-journals on U. Calgary Library website: <http://library.ucalgary.ca/journals>).

Cummings, Michael R. 2006. Mutation: the source of genetic variation. In *Human Heredity: Principles and Issues*. Seventh Edition. Thompson Publishing. USA. Pp. 244-264. (pdf posted on Blackboard)

Disotell (2000) Human genomic variation. *Genome Biology* 1(5):comment2004.1–2004.2. <http://genomebiology.com/2000/1/5/comment/2004>

Dreger, Alice 2011. Is Anatomy Destiny? *Ted.com* http://www.ted.com/talks/lang/en/alice_dreger_is_anatomy_destiny.html

Dugger and McNeil 2006. On the brink: Polio – A fragile immunity – Rumor, fear, and fatigue hinder final push to end polio. *New York Times* (20 March 2006) <http://search.proquest.com.ezproxy.lib.ucalgary.ca/nytimes/docview/433302253/13A8F98AE543554C4F5/2?accountid=9838>

Erhlich, Paul R. and Richard W. Holm 1964. A biological view of race. In *The Concept of Race* Ashley Montagu, editor. Collier Books, London: pp. 154-179. (pdf posted on Blackboard)

Fausto-Sterling, Anne. 1993. The five sexes. *The Sciences*. March/April 1993. <http://ezproxy.lib.ucalgary.ca:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=9305215658&site=ehost-live>

Gonzalez, A.J., L.R. Macias, O.M. Mutchinick. 2004. Beginner's guide to genetics: Sex and genetics (<http://student.bmi.com/student/view-article.html?id=sbmi0411400>) To view you will have to register. It is free.

Groopman, Jerome 1998. Decoding Destiny. *New Yorker*. February 9, 1998. Pp. 42-47. <http://jeromegroopman.com/articles.html> (8th article on the list)

Informed consent for genetic testing- Presymptomatic Huntington disease testing
<http://www.saintfrancisgenetics.com/documents/lab/genweb/411-004HDconsentform06.pdf>

Jones, I. 2003. X and Y chromosomes: Sex and death. Wellcome Trust.
http://genome.wellcome.ac.uk/doc_WTD020741.html (optional reading)

Jones, Steve. 1993. Caliban's Revenge. In *The Language of Genes*. Anchor Books, NY. Pp. 182-196.
(pdf posted on Blackboard)

Kolata, G 1998. Scientists probe the genetic mysteries of a pair of deadly plagues. *New York Times*
<http://www.nytimes.com/1998/05/26/science/scientists-see-a-mysterious-similarity-in-a-pair-of-deadly-plagues.html?pagewanted=all&src=pm>

Kristof, Nicholas D 2009. Learning How to Think, *New York Times*, 26 March.
http://www.nytimes.com/2009/03/26/opinion/26Kristof.html?_r=0

Lewis, Ricki. 2006. Complex Traits. In *Human Genetics*. McGraw-Hill.. (Reserve reading)

Lewis, Ricki. 2006. Extensions and exceptions to Mendel's laws. In *Human Genetics*. McGraw-Hill.
(Reserve reading)

Lewis, Ricki. 2006. Mendel's laws. In *Human Genetics*. McGraw-Hill. (This is an optional reading, for review of inheritance of simple (Mendelian) traits, if necessary). (Reserve reading)

Lewontin, Richard. 1982. Mental Traits. In. *Human Diversity*. WH Freeman, New York. Chapter 7. (pdf posted on Blackboard)

Loomis, WF. 1970. Rickets. *Scientific American* Vol. 223. June. Pp. 77-91. (pdf posted on Blackboard)

Marks, Jonathan 1994. Black, White, Other. *Natural History*. Pp. 32-35.
<http://ezproxy.lib.ucalgary.ca:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=9412070267&site=ehost-live>

Milgram, S (1973) The Perils of Obedience. Harper's Magazine Vol. 247, Pp. 62-78
<http://myclass.peelschools.org/sec/12/28291/Homework/Milgram%20-%20perils%20of%20obediance.pdf>

Minto et al. 2003. The effect of clitoral surgery on sexual outcome. *The Lancet*. 361:1252-1257. DOI: 10.1016/S0140-6736(03)12980-7 (optional reading, available via U. Calgray e-journals <http://library.ucalgary.ca/journals>) (optional reading)

Molnar, Stephen 1998. *Human Variation*. Prentice-Hall, New Jersey. Pp. 34-71.(This is an optional reading, for genetics review, if necessary.) (Reserve reading)

NOVA. How is sex determined? <http://www.pbs.org/wgbh/nova/body/how-sex-determined.html>

NPR 2011. New Genetic Test Screens Would-Be Parents
<http://www.npr.org/2011/01/13/132908098/new-gene-test-screens-nearly-500-childhood-diseases>

NPR 2011. The Ethics Of Genetic Tests For Would-Be Parents.
<http://www.npr.org/2011/01/13/132908943/The-Ethics-Of-Genetic-Screening-For-Parents?ps=rs>

NPR 2011. What If Your Child Says, 'I'm In The Wrong Body'?
<http://www.npr.org/2011/12/26/144156917/transgender-kids>

Padawer, R (2012) What's So Bad About a Boy Who Wants to Wear a Dress?
The New York Times
http://www.nytimes.com/2012/08/12/magazine/whats-so-bad-about-a-boy-who-wants-to-wear-a-dress.html?pagewanted=all&_r=0 (optional reading)

Sagan, Carl 1995. *The Demon-Haunted World: Science as a Candle in the Dark* Science as a Candle in the Dark, Random House / Ballantine Books (section on Scientists' Tools for Skeptical Thinking) (pdf posted on Blackboard)

Sapolsky, Robert M. 1997. The Trouble with Testosterone. In: *The Trouble With Testosterone and Other Essays on the Biology of the Human Predicament*. Simon & Schuster, NY. Pp. 147-159. (pdf posted on Blackboard)

Special Pathogens Branch. 2002. Ebola hemorrhagic fever information packet. Centers for Disease Control and Prevention. Atlanta, GA. <http://www.cdc.gov/ncidod/dvrd/spb/mnpages/ebola.pdf>

SSRC. 2005. Is Race Real? (<http://raceandgenomics.ssrc.org/>)

Assigned readings include:

Leroi, Armand Marie 2005. A Family Tree in Every Gene. New York Times. Published

March 14. p. A23. (<http://raceandgenomics.ssrc.org/Leroi/>) **and 1 of the following 4 papers (you choose)**

- Goodman, Alan. 2005. Two Questions About Race.
- Graves, Joseph L. 2005. What We Know and What We Don't Know: Human Genetic Variation and the Social Construction of Race
- Kaufman, Jay S. 2005. Anatomy of a Medical Myth
- Lewontin, R. C. 2005. Confusions About Human Races

Talenti and Goldstein. 2006. Genomics meets HIV-1. Nature Reviews Microbiology. 4:865-873. (access via E-journals on U. Calgary Library website: <http://library.ucalgary.ca/journals>). (optional reading)

This American Life (Podcast) 2002. "Words" <http://www.thisamericanlife.org/radio-archives/episode/204/81-Words>

UNICEF. 2012. *The State of the World's Children 2012*. Statistics- Nutrition (see summary indicators on p. 95) <http://www.unicef.org/sowc2012/pdfs/SOWC-2012-TABLE-2-NUTRITION.pdf>

US-Venezuela Collaborative Research Project, Wexler (2004) Venezuelan kindreds reveal that genetic and environmental factors modulate Huntington's disease age of onset. Proceedings of the National Academy of Sciences 101(10):3498-3503. (access via E-journals on U. Calgary Library website).

Wiesel, Elie. 1958. *Night*. Bantam Books. New York. (pages 1 - 43) (pdf posted on Blackboard)

Human research: Students will be not be expected to conduct research on themselves or others in this course.

Supplemental fees: There are no mandatory supplemental fees for this course.

Freedom of Information and Protection of Privacy Act

The University of Calgary is committed to protecting the privacy of individuals who work and study at the University or who otherwise interact with the University in accordance with the standards set out in the Freedom of Information and Protection of Privacy Act.

Please refer to the following link for detailed information:

<http://www.ucalgary.ca/legalservices/foip>

Academic Misconduct

Academic dishonesty is an unacceptable activity at the University of Calgary and students are **strongly advised** to read the Student Misconduct section of the University Calendar. Quite often, students are unaware of what constitutes academic dishonesty or plagiarism. The most common are:

- 1) Presenting another student's work as your own
- 2) Presenting an author's work or ideas as you own without proper referencing
- 3) Using work completed for another course

This activity will not be tolerated and students conducting themselves in this manner will be dealt with according to the procedures outlined in the University Calendar.

For detailed information on what constitutes academic misconduct, please refer to the following link:

<http://www.ucalgary.ca/pubs/calendar/current/k-2-1.html>

Plagiarism

Plagiarism involves submitting or presenting work as if it were the student's own work when it is not. Any ideas or materials taken from another source written, electronic, or oral must be fully and formally acknowledged. Plagiarism includes but is not limited to:

- (a) The work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),
- (b) Parts of the work are taken from another source without reference to the original author,
- (c) The whole work (e.g., an essay) is copied from another source, and/or,
- (d) A student submits or presents work in one course which has also been submitted in another course (although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved.

While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence. It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by him or her in a thesis or dissertation.

Emergency Evacuation Assembly Points

In the event of an emergency that requires evacuation, please refer to the following link to become familiar with the assembly points for the class:

<http://www.ucalgary.ca/emergencyplan/assemblypoints>

Safewalk Information

Campus Security, in partnership with the Students' Union, provides the Safewalk service, 24 hours a day to any location on Campus including the LRT, parking lots, bus zones and University residences. Contact Campus Security at (403) 220-5333 or use a help phone, and Safewalkers or a Campus Security Officer will accompany you to your campus destination.

Faculty of Arts Program Advising and Student Information Resources

- Have a question, but not sure where to start? The new Faculty of Arts Program Information Centre (PIC) is your information resource for everything in Arts! Drop in at SS102, call us at 403-220-3580 or email us at artsads@ucalgary.ca. You can also visit the Faculty of Arts website at <http://arts.ucalgary.ca/undergraduate> which has detailed information on common academic concerns.
- For program planning and advice, contact the Student Success Centre (403) 220-5881 or visit them in their new space on the 3rd Floor of the Taylor Family Digital Library.
- For registration (add/drop/swap), paying fees and assistance with your Student Centre, contact Enrolment Services at (403) 210-ROCK [7625] or visit them at the MacKimmie Library Block.

Contact Information for Student and Faculty Representation

Student Union Vice President – Academic

Phone: (403) 220-3911

Email: suypaca@ucalgary.ca

Student Union Faculty Representatives

Sarah Damberger arts1@su.ucalgary.ca 587-7777-5244

Hana Kadri arts2@su.ucalgary.ca 403-667-9220

Kelsy Norman arts3@.su.ucalgary.ca 403-861-2624

Student Ombudsman's Office

<http://www.ucalgary.ca/provost/>

Students Union Representatives for the Faculty of Arts

arts1@su.ucalgary.ca

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arts4@su.ucalgary.ca