UNIVERSITY OF NORTHERN COLORADO
OFFICE OF EXTENDED STUDIES
COLLEGE OF NATURAL AND HEALTH SCIENCES
SPRING 2010

Course Syllabus

Course Number and Prefix: ESCI 575-604: Earth Materials & Health

Credits: One credit hour
Tuition Cost: $250
Date: Sat. Feb. 27 & Sat. March 6, 2010 – 8-5pm
Prerequisites: An introductory geology experience and/or strong interest.

Course description:
This is a one-credit hour course examining common Earth materials and their medicinal and palliative uses. An interactive approach familiarizes the student with rocks and minerals, their occurrences, and their applications in medicine. Hand specimen analysis and field occurrences will be investigated as part of the course.

This is an innovative, interactive, and new course with a novel concept never before presented. It is on the cutting edge of the evolving science of medical geology. This is a multidisciplinary topic which touches upon geology, medicine, anthropology, biology, theology, and other areas.

Course Objectives:
This course seeks to engage the student with Earth materials on a personal basis by discussing the general occurrences and properties of these materials and how they are used in medical settings, including remedies used in the home and everyday life. Students will be schooled to examine the materials with a geologic and medicinal approach and will become knowledgeable about common mineral applications.

Course Outline:

A. Introduction
   1. Introduction to earth materials, general
      a. Igneous, metamorphic, sedimentary, etc.
      b. Rocks, sediments, minerals definition
      c. Mineral properties of hardness, streak, fracture, cleavage, etc.
   2. Introduction to Earth materials in medicine

B. Specific Earth materials in medicine
   Each earth material will be presented with hand specimens (whenever available), experimented with solubility, effervescence, hardness, etc, occurrence, how it interacts with other materials if applicable, its medicinal preparation (if known), medicinal application and its possible pharmaceutical properties. This is not a class in medical treatments but a course designed to understand Earth materials with a new emphasis on beneficial uses.

- borax
- calcite
- clay and mud
- diamond
- epsomite
- gypsum, bassonite, anhydrite
- nahcolite and trona
- pumice and perlite
- salt
- silver and gold
- sulfur
- zeolites

C. Geophagy or ingestion of earth materials as palliatives or curatives
   1. The misunderstood practice of geophagy
   2. Earth materials commonly ingested

D. Applied earth materials in human health (practical, interactive, hands-on)

E. A final quiz

F. Field trip to a local area to collect minerals (location of field trip may vary depending on availability, number of participants, weather, and season)

Course Requirements:
This is a short course with the duration over a weekend (Saturday and Sunday). Students will be required to be present during the whole course. They will be required to take a quiz at the end of the course, and participate in a field excursion.

Method of Evaluation:
Letter grades will be given for this course based on participation and the final quiz. Weighting of required course work is 50% for the quiz, 25% for participation in class sessions, and 25% for participation on the field excursion. Percentages necessary for an A are 90-100%, for a B 80-89+%, for a C 70-79+%, for a D 60-69+%, and for an F below 60%.

Suggested reading:
There are very few books available on this subject. The basis for the course is the Masters thesis by Limpitlaw, U., 2006, Palliative and Curative Earth materials: University of Northern Colorado, Masters Thesis, 384 p. This is the most comprehensive work written on this subject. Excerpts from the thesis will be provided to students for assigned readings.

Other books related to the topic are:

Engel, C., 2002, Wild Health, how animals keep themselves well and what we can learn from them: Boston, MA, Houghton Mifflin, 276 p.

Flannery, M., 2004, Civil War Pharmacy: Binghamton, NY, Haworth Press, 358 p.

Knishinsky, R., 1998, The clay cure: Rochester Vermont, The Healing Arts Press, 104 p.

Reinbacher, R., 2003, Healing Earths, the third leg of medicine: 1st Books Library, Bloomington, IN, 244 p. [ISBN: 1-4033-5096-5]. electronic version from www.1stbooks.com

Robertson, R.H.S., 1960, Fuller's Earth: A history of calcium montmorillonite: Dunmore, Scotland, Voltura Press, 421 p.

Silver in medicine http://www.agion-tech.com/

Worthen, D., 2004, Pharmacy in WW 2: Binghamton, NY, Haworth Press, 279 p.

The following literature list is for the more serious student of medical geology:

Aufreiter, S., Mahaney, W.C., Milner, M.W., Huffman, M.A., Hancock, R.G., Wink, M., and Reich, M., 2001, Mineralogical and chemical interactions of soils eaten by chimpanzees of the Mahale Mountains and Gombe Stream National Parks, Tanzania: Journal of chemical ecology. v. 27, no. 2, p. 285-311. (May be out of print)

Bateson, E.M., and Lebroy, T., 1978, Clay eating by Aboriginals of the Northern Territory: The Medical Journal of Australia, v. 1, no. 1, p. 1-3.

Bergaya, F., Theng, B.K.G., Lagaly, G., eds., 2006, Handbook of clay science, 1: Elsevier Science, 1224 p.

Codish, S., 2005, Mud compress therapy for the hands of patients with rheumatoid arthritis: Rheumatology International, v. 25, no. 1, p. 49-54.

Elizondo, N.V, Ballesteros, E., and Kharisov, B.I., 2000, Cleaning of liquid radioactive wastes using natural zeolites: Applied Industry and Medicine, v. 52, no. 1, p. 27-30.

Gomes, C. and Silva, J., 2006, Minerals and human health, benefits and risks: Santiago, Portugal, Multiponto, 140 p. (This book is written in Spanish and English with both versions included in one book)

Ma'or, Z., Henis, Y., Alon, Y., Orlov, E., Sørensen, K.B., and Oren, A., 2006, Antimicrobial properties of Dead Sea black mineral mud: International Journal of Dermatology, v. 45, no. 5, p. 504-511.

Mumpton, F., 1999, La roca magica: uses of natural zeolites in agriculture and industry: Colloquium paper presented at the National Academy of Sciences colloquium "Geology, Mineralogy, and Human Welfare", v. 96, no. 7, p. 3463-3470.

Pajoumand, A., Shadnia, S., Rezaie, A., Abdi, M., and Abdollahi, M., 2004, Benefits of magnesium sulfate (epsomite) in the management of acute human poisoning by organophosphorus insecticides: Human & Experimental Toxicology, v. 23, no. 12, p. 565-569.

Zarkovic, N., Zarkovic, K., Kralj, M., Borovic, S., Sabolovic, S., Blazi, M.P., Cipak, A., and Pavelic, K., 2003, Anticancer and antioxidative effects of micronized zeolite clinoptilolite: Anticancer Research, v. 23, no. 2B, p. 1589-1595.

Disability Support Services
Students who believe that they may need accommodations in this class are encouraged to contact the UNC Disability Support Services at 970-351-2289 as soon as possible to ensure that accommodations are implemented in a timely fashion.

Honor code:
All members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. Those core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

UNC Policies:
UNC's policies and recommendations for academic misconduct will be followed.