

State University of New York, College at Cortland
Geology Department

GLY 550
Geology of New York State

(Summer, 2005)

Instructor: Dr. Robert Darling
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Office: 323 Bowers
Time: Tuesday, 5:30 - 9:15; Thursday, 5:30 - 9:15
Place: Bowers 339

Text: Isachsen, Y.W., et al., (eds), Geology of New York: A Simplified Account, 1991, New York State Museum, Educational Leaflet No. 28, 284 p. (includes Geological Map)

Website: <http://web.cortland.edu/darlingr/class/geologyNYS/index.html>

Course Description

Geologic history of New York State as interpreted from the rock record. Special emphasis on: Paleozoic stratigraphy and depositional environments; metamorphism, magmatism and deformation of the Adirondack and Hudson Highlands; Grenville, Taconic, Acadian, and Alleghanian orogenic events; Pleistocene continental glaciation. Seven and a half lecture hours per week; 4 weeks. One all-day Saturday field trip required. Prerequisite: GLY 261 or equivalent.

Course Attendance Policy

There is no formal attendance policy. However, exam questions are derived from lecture material. Therefore, if you miss a class, it's like missing a whole weeks worth of material.

Evaluation of Student Performance

Your final course grade will be based on two exams. The relative weight of each is outlined below along with letter grade numerical equivalents. All course requirements (including the field trip) must be completed to receive a grade.

Final Grade = midterm exam = 50 %; final exam = 50 %.

Grades = A+ = 97-99 B+ = 87-89 C+ = 77-79 D+ = 67-69
 A = 94-96 B = 84-86 C = 74-76 D = 64-66
 A- = 90-93 B- = 80-83 C- = 70-73 D- = 60-63 E = 0-59

GLY 550

Geology of New York State

Course Objectives

At the end of this class, each of you should:

1) be familiar with the spatial distribution of rock types in NYS.

(Geologic Map of New York State *in-class reviews*)

2) understand the principles of radiometric & relative dating and its app. to rocks in NYS.

(Review of Geologic Time Scale, Relative Dating, Radiometric Dating *lecture*)

3) be familiar with the various types of orogenic (mountain building) processes.

(Review of Plate Tectonics, Plate Tectonic History of NYS *lecture*)

4) understand orogenic history of NYS as interpreted from the rock record.

(The Grenville Orogeny: Evidence from the Adirondacks and Hudson Highlands *lecture*)

(Effects of the Taconic Orogeny *lecture*)

(The Acadian Orogeny, Middle to Upper Devonian rocks and environments *lecture*)

(Effects of the Alleghanian Orogeny *lecture*)

(The Mesozoic Era and Tertiary Period, the Adirondack Uplift *lecture*)

5) be familiar with record of glacial deposits in NYS and their interpretation.

(Pleistocene Glacial History, Glacial Landforms *lecture*)

6) be familiar with record of sedimentary rocks in NYS and their interpretation.

(The Cambro-Ordovician rocks and environments *lecture*)

(The Silurian section rocks and environments *lecture*)

(Lower Devonian rocks and environments *lecture*)

(Middle to Upper Devonian rocks and environments *lecture*)

7) understand the geology and origin of NYS natural resources.

(Metallic Mineral Resources of NYS and their geologic origin *lecture*)

(Energy and Non-Metallic Resources of NYS and their geologic origin *lecture*)

8) understand the seismic history of NYS and its interpretation.

(Seismic History and Modern Earthquake Hazards *lecture*)

Course Schedule and Activities

Lecture		Assigned Chapter
May 19	Review of Geologic Time Scale, Relative Dating, Radiometric Dating. Review of Plate Tectonics, Plate Tectonic History of NYS. The Grenville Orogeny: Evidence from the Adirondacks and Hudson Highlands.	Chaps. 1, 2 Chap. 3 Chap. 4
May 24	Igneous and Metamorphic History of the Adirondacks. The Cambro-Ordovician rocks and environments, Geol. of the Manhattan Prong. Effects of the Taconic Orogeny.	Chap. 4 Chaps. 5,6,7 Chaps. 6,7
May 26	The Silurian section rocks and environments. Lower Devonian rocks and environments. The Acadian Orogeny, Middle to Upper Devonian rocks and environments.	Chaps. 6,7 Chap. 8 Chap. 8
May 31	Midterm Exam (50 %). Local Field Trip to observe Devonian Sedimentary Rocks (required).	
June 2	Effects of the Alleghanian Orogeny The Mesozoic Era and Tertiary Period, the Adirondack Uplift. Pleistocene Glacial History, Glacial Landforms	Chap. 8 Chaps. 9,10,11 Chaps. 12,13
June 4	Saturday (12 hour) Field Trip to Black River Valley and Adirondack Lowlands (required).	
June 7	Metallic Mineral Resources of NYS and their geologic origin. Energy and Non-Metallic Resources of NYS and their geologic origin. Seismic History and Modern Earthquake Hazards.	Chap. 15 Chap. 15 Chap. 17
June 9	Final Exam (50 %)	

If you are a student with a disability and wish to request accommodations, please contact the Office of Student Disability Services located in B-40 Van Hoesen Hall or call (607) 753-2066 for an appointment. Information regarding your disability will be treated in a confidential manner. Because many accommodations require early planning, requests for accommodations should be made as early as possible.

Selected Readings:

- Heizler, M.T., and Harrison, T.M., 1998, The thermal history of New York basement determined from $^{40}\text{Ar}/^{39}\text{Ar}$ K-feldspar studies: *Journal of Geophysical Research*, v. 103, p. 29,795-29,814.
- Isachsen, Y.W., 1975, Possible evidence for contemporary doming of the Adirondack Mountains, New York and suggested implications for regional tectonics and seismicity: *Tectonophysics*, v. 29, p. 169-181.
- Isachsen, Y.W., 1981, Contemporary doming of the Adirondack Mountains: further evidence from releveling: *Tectonophysics*, v. 71, p. 95-96.
- McLelland, J.M., and Isachsen, Y.W., 1986, Geological synthesis of the Adirondack Mountains and their tectonic setting within the southwest Grenville Province: new perspectives: *Geological Association of Canada Special paper 31*, p. 75-94.
- Mullins, H.T., and Hinchey, E.J., 1989, Erosion and infill of New York Finger Lakes: Implications for Laurentide ice sheet deglaciation: *Geology*, v. 17, p. 622-625.
- Roden-Tice, M., Tice, S.J., and Schofield, I.S., 2000, Evidence for differential unroofing in the Adirondack Mountains, New York State, determined by apatite fission-track thermochronology: *Journal of Geology*, v. 108, p. 155-169.
- Sbar, M.L., and Sykes, L.R., 1977, Seismicity and lithospheric stress in New York and adjacent areas: *Journal of Geophysical Research*, v. 82, p. 5771-5789.