SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: **PHYSICAL GEOLOGY**

CODE NO. : **NRT238** **SEMESTER:** **3**

PROGRAM: **PARKS & OUTDOOR RECREATION**

AUTHOR: **Lawrence Foster**

DATE: **May 2014** **PREVIOUS OUTLINE DATED:** **Sept 2013**

APPROVED:

"Colin Kirkwood"

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Dean **DATE**

TOTAL CREDITS: **4**

PREREQUISITE(S): **NONE**

HOURS/WEEK: **3 HRS/WEEK X 15 WEEKS**

Colin Kirkwood, Dean, Environment/Technology/Business
(705) 759-2554, Ext. 2688

I. COURSE DESCRIPTION:

Students will gain an understanding of the processes that have led to the incredible variety of formations in the rocks and soils of our region. These will be related to land use and travel patterns both contemporary and historical. Included will be rock formation, minerals, surficial geology, soils and fossil formation and identification.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Explain the Geological Development of the Earth since the Beginning of its formation.

   Potential Elements of the Performance:

   - Describe the makeup of the earth
   - Explain the theory of plate tectonics, (continental drift)
   - Explain why magnetic reversals are observed
   - Explain the structure of subduction zones and their associated phenomena
   - Describe mid-oceanic ridges
   - Describe the geological time scale and how it applies to Ontario
   - Explain the development of the present-day continents.
   - Explain the major dating processes used to determine the age of rocks

   This learning outcome will constitute 20% of the course's grade.

2. Identify common rocks and minerals of the Algoma Region.

   Potential Elements of the Performance:

   - Explain the diagnostic tests and techniques used in determining different minerals.
   - Explain the diagnostic tests and techniques used in determining rock type.
   - Identify common minerals found in the Algoma District using the diagnostic tests and techniques described above.
   - Identify metamorphic, sedimentary and igneous rocks found in the Algoma District using the diagnostic tests and techniques

described above.

This learning outcome will constitute 35% of the course's grade.

3. Describe the rock cycle and the associated processes, rocks and formations.

Potential Elements of the Performance:

- Identify and explain the formation of sedimentary rocks.
- Describe the main types of sedimentary rock found in Ontario in relation to rock type, origin, characteristics and age
- Identify major fossil groups found in the sedimentary rocks of Ontario
- Identify and explain the formation of metamorphic rocks.
- Identify and explain the formation of igneous rocks.
- Identify and describe formations within the rock cycle.
- Relate each of the above to Ontario's geological time scale

This learning outcome will constitute 25% of the course's grade.

4. Explain the major glacial events in Ontario's recent history and describe the resulting impacts on Surficial Geology and Landforms produced.

Potential Elements of the Performance:

- On maps of Ontario, describe the sequences of glacial advances and associated glacial lakes
- Explain Isostatic rebound and how this phenomenon has left its mark in Algoma District
- Identify and explain the formation of glacial landforms such as eskers, drumlins, kames, potholes, outwash plains and moraines
- Explain climate change in the recent epoch and its impact on animal and plant populations

This learning outcome will constitute 20% of the course's grade.

IV Required Resources/Texts/Material:

Pye. E.G. 1997. Roadside Geology of Ontario: North Shore of Lake Superior. Ontario GEOservices Centre, ROCK ON Series 2, 164 pp.

Some Other Resources Available on Reserve in the Library:

Eyles, N. 2002. Ontario Rocks, three Billion Years of Environmental Change.Fitzhenry & Whiteside, Markham (ON).339 pages.

American Geological Institute. 1984. Dictionary of Geological Terms. Toronto, Anchor Books, Doubleday 571 pp.

Annelis, R.N. 1973.Proterozoic Flood Basalts of Eastern Lake Superior: The Keweenawan Volcanic Rocks of the Mamainse Point Area, Ontario. Geol. Survey Can., Pap. 72-10. 51 pp, map, figure.

Chernicoff, S., H.A. Fox and R. Venkarakrishnan. 1997. Essentials of Geology. New York, Worth Publ. 411 pp. Appendices.

Geddes, R.S., F.J. Kristjansson and J.T. Taylor. 1987. XII th Inqua Congress Field Excursion c-12. Quaternary Features and Scenery along the North Shore of Lake Superior.62 pp.

Hewitt, D.F., and E.B. Freeman. 1978. Rocks and Minerals of Ontario, Revised Edition. Ontario Department of Mines and Northern Affairs, GC 13, 145 pp.

Karrow, P.F. 1991. Quaternary Geology, St. Joseph Island. Ont. Geol. Surv., Open File Rep. 5809. 81 pp. maps.

Levin, H.L. 1988. The Earth Trhough Time. Philadelphia, Saunders College Publishing. 595 pp plus Appendices, Index.

Levin, H.L. 1990. Contemporary Physical Geology. Toronto, Saunders. 623 pp.

Lutgens, F.K. and E.J. Tarbuck. 2000. Essentials of Geology. Upper Saddle River (NJ), Prentice Hall.449 pp.

Merritts, D., A. De Wet and K. Menking. 1998. Environmental Geology. New York, W.H. Freeman. 452 pp.

Ministry of Northern Development and Mines, Ontario 1994. ROCK Ontario. ROCK ON Series 1,Queen's Printer for Ontario, Toronto 89 pp.

Mottana, A. et al. 1977. Simon & Schuster's Guide to Rocks and Minerals. New York, Fireside Books, Simon & Schuster 607 pp.

National Geographic Society. 1976. Our Continent, a Natural History of North America. Washington, National Geographic Society. 398 pp.

Press, F. and R. Siever. 2000. Understanding Earth. NY. W.H. Freeman. 573 pp.

Robertson, J.A. and K.D. Card. 1972. Geology and Scenery, North Shore of Lake Huron Region. Ont. Geol. Survey, Geol. Guide Book 4. 224 p.

Russell, L.S. 1965. The Mastodon. Royal Ontario Museum, Toronto. 16 pp.
Shrock, R.R. and W.H. Twenhofel 1953. Principles of Invertebrate Paleontology. New York, McGraw-Hill. 816 pp

Sabina, A. P. 1991. Rocks and Minerals for the Collector; Sudbury to Winnipeg. Geol. Survey Canada Misc. Rep.49:315 pp.

Strickland, D. 1998. Brent Crater Trail, History of the Crater. Whitney (ON), Friends of Algonquin Park. 14 pp.

Symes, R.F. et. al. 1988. Rocks & Minerals. Toronto, Stoddard Publ. 64 pp.

Tarbuck, E.J. and F.K. Lutgens. 2005. Earth, an Introduction to Physical Geology. Upper Saddle River (NJ), Pearson Prentice-Hall. 711 pp.

Theberge, J.B. 1989. Legacy, The Natural History of Ontario. Toronto, McClelland & Stewart Inc. 397 pp. (available in reference section)

Thompson, I. 1997. National Audubon Society Field Guide to North American fossils. New York, Alfred A. Knopf. 846 pp.

Tovell, W.W. 1979. The Niagara River. Toronto, Royal Ontario Museum. 25 pp.

Tovell, W. M. 1992. Guide to the Geology of the Niagara Escarpment, with Field Trips. Niagara Falls (ON), Niagara Parks Commission. 159 pp., Field Trips a-1 to J-8 and Appendices.

Thurston, P.C. et al. (Editors) 1991. Geology of Ontario, Ontario Geological Survey, Special Volume 4, Part 1. 711 pp., part 2, 1525 pp.

Verma, H. M. 1979. Geology and Fossils, Craigleith Area, Ontario. Ont. Geol. Survey Guidebook 7, 61 pp.

Waddington, J. 1979. An Introduction to Ontario Fossils. Toronto, Roy. Ont. Mus. 28 pp.

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade will be determined on the basis of the following:

LMS Quizzes	40%
Rock Identification Quiz	10%
Mineral Identification Quiz	10%
Presentations	20%
Final Exam	20%
Total	100%

There will be up to 4 field trips to view geological formations. Attendance on field trips is mandatory. All marks for reports on these trips will be forfeited for non-attendance.
Field trips are scheduled as per the course syllabus.

All reports will be discounted 10% per day late. Presentations are to be done on prescribed day or will also be discounted.

The following semester grades will be assigned to students:

Grade	**Definition**	*Grade Point Equivalent*
A+	90 – 100%	4.00
A	80 – 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.

W	Student has withdrawn from the course without academic penalty.

SPECIAL NOTES:

Attendance:
Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. It is the departmental policy that once the classroom door has bee enclosed, the learning process has begun. Late arrivers will not be granted admission to the room.

Retention of Course Outlines:
It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Communication:
The College considers ***WebCT/LMS*** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the ***Learning Management System*** communication tool. Student lead activities may require adhering to an alternate source of communication.

Course Outline Amendments:
The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.