

**GEOL-200
OCEANOGRAPHY**

An introduction to marine science for general science students. Major topics include; the geologic setting of ocean basins and their contained sediments; the chemistry and biochemistry of seawater; the physics of ocean waves, tides and currents; ocean-atmosphere interaction and climate; the marine biosphere and its pelagic, nektonic and benthic organism communities in polar to tropical realms; marine resources; environmental concerns and global change.

"a holistic approach"

INSTRUCTORS

Professor **Noel P. James** (36170) james@geol.queensu.ca
Professor **Kurt Kyser** (36179) kyser@geol.queensu.ca

LECTURES

Room 105 MILLER HALL
Monday 09:30am
Wednesday 08:30am
Thursday 10:30am

The material in lectures will complement (but NOT repeat) that in the book

TEXT

Garrison, T., 2001,
ESSENTIALS OF OCEANOGRAPHY
Brooks/Cole Publishing Company
Pacific Grove California
3rd edition, 352p.

Course Structure

INTRODUCTION

GEOLOGICAL

The Ocean in an Evolving Earth

The modern ocean in the context of plate tectonics and earth structure. Ocean-tectonic interactions through time. The nature of continental margins and ocean basins. The origin of marine sediments, the record of ancient oceans.

CHEMICAL

The Chemistry of Seawater

The chemistry and biochemistry of ocean water, modern and ancient. Controls on seawater composition, variations in the modern ocean. Cycling of major ions.

PHYSICAL

Dynamics of the Ocean and Atmosphere

The physics of ocean water. The nature of atmospheric and oceanic circulation and their interdependence. The origin of waves and tides. The nature of coastlines and current problems.

BIOLOGICAL

Life in the Ocean

The controls on ocean life. Primary productivity, plankton, marine algae and grasses. Critical invertebrates of the marine realm. Diversity of marine vertebrates. Organism communities in the world ocean.

FUTURE TRENDS Is the Ocean Sustainable?

Characteristics of biological ocean resources. Geological resources and their exploitation. The ocean and global change.

MARKING

Mid-term Exam

- Weds October 15
- 40% of final mark
- duration 2 hours (likely evening)
- all material from both book and lectures up to that time

Final Exam

- December exam period
- duration - 3 hours
- 60% of final mark
- total course material, but emphasis on post mid-term material

Exam format

- exam written by both instructors
- variable; short & long answer, and possible multiple choice
- test understanding of material and how you can use it to address current concerns

Final Mark

- a sum of mid-term and final

GEOL. 200 OCEANOGRAPHY 2003 Tentative Schedule

Lectures - Mon 9:30; Wed 8:30; Thurs 10:30 - Miller 105

<u>Date</u>	<u>No.</u>	<u>Instructor</u>	<u>Topic</u>
M Sept. 08	1	NJ/KK	Introduction
W Sept. 10	2	KK	Earth and Ocean Origin
T Sept. 11	3	NJ	History of Oceanography
M Sept. 15	4	KK	Earth Structure
W Sept. 17	5	KK	Continental Margins
T Sept. 18	6	KK	Deep Ocean Basins
M Sept. 22	7	NJ	Ocean Physics
W Sept. 24	8	NJ	Atmosphere/Weather
T Sept. 25	9	NJ	Ocean Circulation
M Sept. 29	10	NJ	Waves
W Oct. 01	11	NJ	Tides.
T Oct. 02	12	NJ	Coasts
M Oct. 06	13	KK	Ocean Chemistry-1
W Oct. 08	14	KK	Ocean Chemistry-2
T Oct. 09	15	KK	Ocean Biochemistry
M Oct. 13	Thanksgiving		
W Oct. 15	--	KK	Mid-Term Exam
T Oct. 16	16	KK	Chemical Cycling-1

M Oct. 20	17	KK	Chemical Cycling-2
W Oct. 22	18	KK	Biogenic sediments
T Oct. 23	19	KK	Terrigenous Sediments
M Oct. 27	20	RH	Remote Sensing-1
W Oct. 29	21	RH	Remote Sensing -2
T Oct 30	22		Off
M Nov. 03	23	NJ	Life in the Ocean
W Nov. 05	24	NJ	Primary Productivity
T Nov. 06	25	NJ	Lower Invertebrates
M Nov. 10	26	NJ	Advanced Invertebrates
W Nov. 12	27	NJ	Vertebrates - Fish
T Nov. 13	28	NJ	Vertebrates - Birds/Mammals
M Nov. 17	29	NJ	Strandline Communities
W Nov. 19	30	NJ	Reef Communities
T Nov. 20	31	NJ	Open Ocean Communities
M Nov. 24	32	NJ	Mineral, Hydrocarbon Resources
W Nov. 26	33	WL	Fish Population Dynamics
T Nov. 27	34	KK	Environmental Concerns