

BASIN ANALYSIS GEOL 4890

Spring Term, Jan-April

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Laboratory Demonstrator: TBA (office hours posted later)

Introduction

Many geoscientists today consider basin analysis a newly emerging field that has only recently come about by the interaction and cooperation of sedimentologists, geophysicists, geochemists, and structural geologists. In fact, the subject of basin analysis, as a distinct subdiscipline of the earth sciences, has been an entity for nearly six decades. During the past half century numerous dogmas have arisen within the overall subject of basin analysis, ranging from the early concepts of flysch and molasse sedimentary regimes through sedimentary facies analysis of the 1960's and 1970's, sequence and cycle investigations of the 1970's and 1980's, process sedimentology, and seismic stratigraphy of the 1980's and 1990's.

Basin analysis *today* is generally viewed in the broadest sense possible: *the paleogeographic reconstruction of an area(s) where sediments have accumulated during a particular time span to a significantly greater thickness than the surrounding area.* It requires an understanding of a wide variety of often quite diverse geological specialties. The purpose of this course is to provide a *synthesis* and *overview* of how these various subdisciplines fit together into the modern science of basin analysis.

Course Content:

A *tentative* schedule of topics to be covered in this course is:

Month of January: Introduction, Basin classification, Stratigraphic analysis and depositional systems; Depositional architecture; Basin Fill, Thermal evolution; Fluids & plumbing

Month of February: Origin and tectonic development of basins; Basin models, Quantitative basin modelling

Months of March/April: Western Canada Sedimentary Basin and other basins of the world

Course Format and Grading:

This course will consist of mainly seminars with some lectures, guest speakers, and audiovisual presentations. Classes will be held during the normal meeting slot (slot 9) at 11:30-1:00 on Tuesdays and Thursdays, with Thursday afternoons (14:30-17:30) reserved for laboratory sessions and/or seminar or special guest speakers.

Grades will be assigned on the basis of:

Final Examination(s): 40%

Seminar & Class Participation: 35%

Term Project: 25%

The following grading scheme will be applied:

Letter Grade	Percentage range	Description
A+	□ 90-100	Exceptional
A	□ 80-90	Excellent
B+	□ 75-80	Very Good
B	□ 70-75	Good
C+	□ 65-70	Satisfactory
C	□ 60-65	Adequate
D	□ 50-60	Marginal
F	< 50	Failure

Seminars:

In addition to taking an active discussion role in all seminars, each participant is required to organize and conduct *one* seminar presentation during the term. Seminar topics are posted and participants are required to sign up for a topic; deadlines for sign-up will be announced. The final schedule of seminar topics and leaders will be available during the latter part of January. Guidelines and required format will be discussed in class. This seminar presentation and participation in all other seminars is worth 35% of the final mark (25% for seminar and 10% for seminar discussion/participation).

Final Examination(s):

There will be *two* final examinations: one covering the lectures and lecture reading (including guest lectures and *all* audiovisual presentations) content of the course (25%), and the other covering the 'laboratory' part of the course (take home practice exercises and lab readings)(15%). The 'theory' final examination will be two hour essay and/or shorter answer type and will be scheduled by the

university; the 'lab' final exam will be a two hour 'short answer' format and will take place in the *last regularly scheduled lab or lecture slot*.

Term Project:

Participants are required to submit the results of a term research project on a specific and clearly defined theme of their own choice. The only constraints are that the subject of the term project must be related to 'basin analysis' and must *not* be the same specific topic as their required seminar presentation. All topics must be approved, and a 500-1000 word (2-4 pages double-spaced typescript) overview/outline/summary & written proposal is required by the end of January. This proposal should be well organized and show clearly that considerable initial research has been done on the topic. The proposal document will be evaluated and returned with comments. Although a preliminary reference list would be in order, please do not simply hand in a download of GeoRef references!

The term project should ultimately reflect a synthesis of past investigations, an exposé of the current thinking, and a critical evaluation of the future directions of the selected topic. Students are strongly encouraged to start early on their library research because it is very likely that interlibrary loans will be necessary. The final formal presentation format of the project is to be one of the following three methods: (i) a written paper; (ii) a seminar; or (iii) a poster presentation. General guidelines regarding each of these presentation formats will be given later in the term. Briefly, a written term paper should normally be about 7500 to 15,000 words (30-60 pages double-spaced typescript), although this can vary substantially depending upon the nature of the topic. A seminar would normally consist of an oral presentation of about 45 to 60 minutes in length with the seminar supplemented by handouts (if appropriate) and an annotated bibliography (required). A poster presentation would also involve handouts (if appropriate) to supplement the material on exhibit in the poster as well as an annotated bibliography (required). Term papers will be due at the time of the final examination (to be set by the university). Late papers (or other project material) will be penalized 20% per day. The other two formats will be done at a mutually agreeable lecture or lab slot during April. It is necessary to indicate your choice of presentation format within your project overview/proposal due at the end of January. The term project is worth 25% of the final mark, and will be evaluated on the basis of the scientific contribution, proposal, and quality of presentation.

Textbook and Assigned Readings:

There is no officially required textbook for this course. However, numerous assigned readings will be made from library monographs and journals. In addition, as part of your role as seminar leader, it is expected you will conduct library research and examine non-assigned readings.

You should read and be aware of the University of Manitoba academic regulations and policy the 2004-2005 University Undergraduate Calender. I am instructed by ROASS policy to advise you to read the academic

regulations and policies in the 2004-2005 University Undergraduate Calendar. In particular, be aware of the policies regarding academic dishonesty, including “plagiarism and cheating”, “examination personation”, and “attendance at class and debarment”. In the case of individual assignments, I will provide specific instructions concerning due dates at the time each assignment is made. If you have any questions, ask! Late assignments of any kind will be penalized 20% per day. The last date for voluntary withdrawal is March 18, 2005.