Geology 9564a, Basin Analysis & Sequence Stratigraphy

Time, Place
Fall Term.  Wednesday, 9:00 to 10:30 and Wednesday, 1:30 to 2:30.  Room 1084 B&G Bldg.
Lecture and laboratory sessions combined.

Prerequisites.
This is a graduate level only course, and pre-supposes a working knowledge of sedimentary processes, depositional environments and facies; plate tectonics, structural geology and a little geophysics.

Instructor: Dr. A. G. Plint.  Rm 1072, B&G building, gplint@uwo.ca

Outline
Basin Analysis is many things to many people!  However, most workers would now agree that Basin Analysis is fundamentally concerned with i) Subsidence History, and ii) Paleogeographic Evolution of a sedimentary basin.  These aspects are investigated primarily through the disciplines of stratigraphy, sedimentology, structural geology and geophysics.

Lectures  In order to understand the fill of a sedimentary basin, it is first important to review the basic physical properties of the lithosphere, and the mechanisms by which large chunks of the lithosphere are made to subside in order that sediments may accumulate.  In view of this, the first part of the course will consider Lithospheric Rheology, followed by a discussion of the Main Basin Types in their plate-tectonic context.  The second theme of the course will concern Stratigraphy.  In this section, I will look at some of the important ideas in this field, including Depositional Systems and Systems Tracts, Chronostratigraphic methods, Seismic Stratigraphy, Sequence Stratigraphy and Stratigraphic Cyclicity.  These aspects are very important because they allow the basin analyst to define a time stratigraphy for the basin.  This is an essential prerequisite to any sort of paleogeographic analysis, and is also critical in analysis of relative sea level changes.  Key slides from lectures will be posted to the class website before each class.

Lab Exercises  We will examine a number of practical problems during the labs.  I will utilise a number of classic seismic sections in order to attempt to determine some basin-forming mechanisms.  We will also undertake one or more sequence stratigraphic exercises where the basic character of key stratigraphic surfaces, systems tracts, and chronostratigraphy will be explored.

Evaluation
Students can elect whether to be evaluated entirely on the basis of a Term Paper and an Oral presentation (=100% course mark), or whether to be evaluated on a Term Paper and oral presentation (60%) and a Final Exam (40%).  Lab exercises are not marked, but will be discussed in class.

Term Paper.  Each student in the course will choose, or be assigned, a topic to investigate, based on published literature.  Results are to be presented in the format of a scientific review paper (e.g. Journal of Sedimentary Research), and each paper should not exceed 15 typed, double-spaced pages, including a 300 word Abstract; Figures and References do not count in the 15 page limit.  Each paper will be reviewed and edited by the instructor, and each student will be invited to discuss comments on their essay in a personal tutorial session. A summary of your findings will be presented to the class in an approximately 15 minute talk.  Papers will be submitted as hardcopy, and also as electronic WORD document for possible checking by Turnitin software (see ‘Academic Offences’ below).
Academic Offences:
“Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf .”

“All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com ( http://www.turnitin.com ).”

Absence from Exams
If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: http://www.uwo.ca/univsec/handbook/appeals/medical.pdf

Accommodation due to Illness
A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here: https://studentservices.uwo.ca/secure/medical_document.pdf

Accessibility Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Books There are some good summary texts available, and I recommend these as a good basic source of additional references when researching your topics. The first two listed below are probably the best. Tectonics of Sedimentary Basins, edited by Cathy J. Busby & Raymond V. Ingersoll. 1995, Blackwell Science, 579 p. QE571.T355
(unfortunately dropped from the 3rd (1996) edition of this classic book). QE571
