SEDIMENTATION AND TECTONICS
Lecture (2 units: GEOL 523) - Laboratory (2 units: GEOL 523L)

MEETING TIMES: Lect/Seminar T 2:00-3:45pm in LO 1210; Lab (6 hours/week) F 9:30am-12:15pm and M 2:30-4:30pm or T 10-12pm. Room: LO 1210
INSTRUCTOR: Dr. Kathleen Marsaglia, Live Oak Hall 1233, kathie.marsaglia@csun.edu, 818-677-3541; Office hours: Thursday 11-12 or by appointment.
PREREQUISITES: GEOL 310 (structure) and 341 (Sedimentology/stratigraphy) or consent of instructor; Previous use of a petrographic microscope in the study of igneous, metamorphic and/or sedimentary rocks is assumed.

COURSE DESCRIPTION AND GOALS: This course is meant to provide you with advanced training in sedimentary petrography, a background in global geology and tectonics, and an introduction to the structural and sedimentary styles of various types of sedimentary basins. Lecture topics will include a review of plate tectonic theory, followed by detailed discussions of the sedimentary and structural history of basins from assorted tectonic settings. Assigned readings will include text chapters and selected journal articles. In the laboratory, students will examine and analyze suites of thin sections of sediments and sedimentary rocks, particularly clastic sedimentary rocks. It will address the collection and analysis of field data used in basin studies. The sedimentary history of California basins and aspects of basin analysis will be introduced during one or two weekend field trips. This course addresses many of the Graduate Student-Learning Outcomes (SLO) including: SLO1 - application of theoretical, conceptual, and observational knowledge to the analysis and solution of geologic data and problems; SLO3 – ability to compile and critique geologic literature pertinent to original research; SLO4 - competence in collection, synthesis, and interpretation of original geologic data; SLO5 - Clear and articulate communication of geologic knowledge, findings, and interpretations in oral presentations; and SLO6 – writing well researched, well organized, well illustrated, and well written technical reports.

CLASSROOM ETIQUETTE: No cell phones (talking and texting) or pagers in class. If you need to make a call during open lab time, please leave the classroom to do so. I reserve the right to restrict computer note taking if students are observed to be playing games, surfing the web and checking email during lecture. Lectures/labs will begin promptly at the start of the designated class time. You should already be familiar with campus parking and traffic situations, so these are not valid excuses for chronic tardiness. If on occasion you are late, it is your responsibility to get notes from another student.

ACADEMIC DISHONESTY: Academic dishonesty will not be tolerated and evidence for such will be reported to the Office of the Vice President for Student Affairs with my recommendation for disciplinary action, and assignment of a failing grade for the course. Official California State University policy states: Cheating or plagiarism in connection with an academic program at a campus is listed in Section 41301, Title 5, California Code of Regulations, as an offense for which a student may be expelled, suspended, or given a less severe disciplinary sanction. Such dishonesty includes but is not limited to: cheating, fabrication, facilitating academic dishonesty, and plagiarism.”

ATTENDANCE: There are NO MAKEUPS for exams or exercises associated with unexcused absences. All absences are considered unexcused except those I deem otherwise.

GRADING: A plus/minus grading scale will be used.

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Supplemental Texts/Materials: 1) {MT}Milliken et al., 2006, Sandstone Tutorial CD-Rom, AAPG (access provided by dept.); 2) {TC}Taylor, T., et al., in prep., Quantitative Petrographic Analysis of Sandstones (QPAS), 6 chapters (Detrital Components; Authigenic Minerals; Porosity Types; Quantitative Textural Analysis; Compaction; Modal Analysis); and 3) Other - Assigned readings from the literature.

TENTATIVE SCHEDULE:

INTRODUCTION
Week 1 (Review and Milliken et al., tutorials {MT} and Taylor et al. book chapters {TC}) Aug 28-31 Syllabus; Introductory Lecture & Exercise (Lab: Petrography review and introduction to Milliken et al. tutorial; Quartzose Sand/Sandstone)

INRACRATONIC BASINS - QUARTZOSE SAND AND SANDSTONE
Week 2 (B&A Ch 1, 30; B&I Ch 1, 13; {TC} {MT} + readings) Sept 4-7 Intro to Sediment. Basins, Intracratonic Basins (Labs - Quartzose sandstone)

RIFTS AND PASSIVE MARGINS - FELDSPATIC SANDSTONE
Week 3 (B&A Ch 9; B&I Ch 3; {TC} {MT} + readings) Sept 11-14 Rift Basins & Proto-Oceanic Troughs (in lieu of Friday Lab – Taylor et al. chapter Critiques)
Week 4 (B&A Ch 12, 13; B&I Ch 4; {TC} {MT} + readings) Sept 18-21 Rifted Continental Margins (Labs - Feldspathic sand and sandstone exercise)

TRANSFORM-RELATED BASINS – LITHIC SANDSTONE
Week 5 (B&A Ch 10, 11; B&I Ch 12; {TC} {MT} + readings) Sept 25-28 Strike-slip and Transrotational Basins (Labs – Lithic sand and sandstone)

Week 6 Lecture Exam and Expo Oct 2-5 Lecture Exam 1 (Cratons, Transforms, Rift-Passive) in Lieu of Friday Lab – Attend PS-AAPG Expo
Week 7 Lab Exam and Critiques ( {TC}) Oct 9-12 Lab Exam 1 (QFL sandstones) on Tuesday (in lieu of Friday Lab – Taylor et al. chapter Critiques)

MAGMATIC ARC AND OCEAN BASINS - MUD AND VOLCANICLASTIC SANDSTONE
Week 8 (B&I Ch 5,6,7,8; Smear Slide Tutorials: Marsaglia et al. 2015, 2016) Oct 16-19 Intro to Magmatic Arcs - trench-forearc-intraarc-backarc (Lab - Ocean Basins and their mud)
Week 9 (B&A Ch 15,16,17,18,19; volcaniclastic readings; {TC} {MT}) Oct 23-26 Magmatic Arc Seminar; (Labs – Volcanic sand and sandstone)

PLATE MARGINS IN TRANSITION
Week 10 (B&A Ch 14; Other arc readings; volcaniclastic readings {TC} {MT}) Oct 30, Nov2 Magmatic Arc Seminar cont. (Labs – Volcanic sand and sandstone)

OLD AND NEW TECHNIQUES IN BASIN ANALYSIS
Week 11 (B&A Ch 2-7 + other selected readings on methods in basin analysis) Nov 6-9 Methods in basin analysis (Labs – Regional Sample suites) Nov 10-12 Field Trip

FORELAND BASINS – REGIONAL SAMPLE SUITES
Week 12 (B&I Ch 9, 10, 11) Nov 13-16 Intro to Foreland Basins (Lab Exam 2 - Regional sample suites)

Week 13 (B&A 8, 20, 21, 22, 23, 24, 25, 26, 27 + additional readings;) Nov 20 -TG Foreland Basin Seminar (no lab on Friday, Thanksgiving!)
Week 14 Nov 27-30 (Independent student project work)
Week 15 Dec 4-7 Lecture Exam 2 (Arc-associated Basins and Foreland Basins) (Lab – Exam 2, mud, volcaniclastics and methods)
Week 16 Dec 11 Last lecture period (Independent project work)
Week 17 – FINALS WEEK Dec 18 3:00-5:00pm Student presentations of final projects