SYLLABUS
EARTH, PLANETARY & SPACE SCIENCES 136B: APPLIED GEOPHYSICS

Instructor:
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Geology 2712, phone: 310-794-7090
Office hours: W: 1:00 – 3:00 or by appointment
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Lecture Location and Time:
4677
Time: TBD

Course web pages: https://ccle.ucla.edu/course/view/18S-EPSSCI136B-1 (Lectures, materials)
Course Description: Lecture, three hours; laboratory/field trips, six hours. Preparation: knowledge of one of MATLAB, IDL, Fortran 90 or C++. Requisite: course 136A. Principles and techniques of exploration for mineral deposits using natural and artificial electric and magnetic fields. Methods include self potential, resistivity, induced polarization, electromagnetics, magnetotellurics, magnetics. P/NP or letter grading.
GE Status: **Not a GE course**
Units: 4.0
Grading Detail: Letter grade or Pass/Not Pass
Requisites: 136A
Textbook: Applied Geophysics Telford, Geldart, Sheriff & Keys, 1st edition: 1976, 2nd edition: 1990.
Online: http://uclibs.org/PID/169813 (2nd edition). **On reserve:** Geology library (2nd edition).
Also book PDF is in course web pages under "Resources".

Week	D	Date (TBC)	EPSS 136B, Spring 2018	ADL. READING
1	T	3-Apr-18	Organizational/Overview and Model Inversion	3.4
	R	5-Apr-18	Inverse Theory and the Dipole Field	3.1-3.3
2	T	10-Apr-18	Induced Dipole and Central Potential Fields	-
	R	12-Apr-18	Magnetic Field Modeling	3.6
3	T	17-Apr-18	Practical Considerations of Magnetic Modeling	3.6
	R	19-Apr-18	Maps and Projections	-
4	T	24-Apr-18	Resistivity Theory	8.1-8.3
	R	26-Apr-18	Resistivity Inversion Methods	skim 8.4-8.5
5	T	1-May-18	Resistivity Profiling for Vertical and Horizontal Layers	skim 8.6-8.7
	R	3-May-18	Practical Considerations of Resistivity Method	
6	T	8-May-18	Self Potential Theory and Application	6.1.1 -.4; 6.3.1
	R	10-May-18	EM Wave Propagation in a Conductor	6.2.1-6.2.4
7	T	15-May-18	E/H Ratio in the Magnetotelluric Method	6.2.5
	R	17-May-18	Sources of ULF waves; MT Instruments and Procedures	6.2.6-.7; 6.3.2-.3
8	T	22-May-18	EM Methods: Overview and Theory	7.1 - 7.3
	R	24-May-18	EM Methods: Equipment and Field Systems	7.4 - 7.6
9	T	29-May-18	EM Methods: Modeling and Interpretation	7.7 - 7.8
	R	31-May-18	EM-VLF Methods: Theory	-
10	T	5-Jun-18	EM-VLF Methods: Field Systems and Interpretation	-
	R	7-Jun-18	Review	-

Course Grading:
Your performance will be evaluated from the following: (i) The final which will be based on concepts from lecture notes and exercises (50%); (ii) Three homework assignments (20%), and (iii) Five lab exercises (30%). The *final* will be a series of simple questions asking to clarify or discuss a concept, a mechanism, a technique or a geophysical condition/situation. You will not need a bluebook or a calculator (although you can bring one if you wish). The *homeworks* will be assigned from the book. The *lab exercises* will be based on MATLAB and will be based on data processing from previous field trips to extract information from geophysical data, including modeling and inversion.