

**GEOGRAPHY 112****Environmental Hydrology – Fall 2014 UCSB**

**Instructor:** Hugo A. Loáiciga (hugo@geog.ucsb.edu web page: <http://www.geog.ucsb.edu/~hugo>)

**Office hours:** Tuesday/Thursday, 11 am-12 noon; or by appointment **Room:** 3626A Ellison Hall;

**Teaching Assistant:** Sarah Shivers (swshivers@gmail.com)

**T.A.'s office hours:** Wednesdays 1:30 pm – 3:30 pm Room 3611 Ellison Hall

**T.A.'s office room:** 3626 Ellison Hall

**Lecture hours:** Tuesday & Thursdays, 9:30 am-10:45 am Ellison 3621

**Laboratory:** Wednesday – 5:00 - 6:50 pm 2525 Phelps Hall or other (see note 4 below):

**Textbook:** Not applicable; *Reader Geography 112*, available at **The Alternative Digital Printing**, UCSB University Center (UCEN).

Laboratory	Date and time	Place	Report due: at the start of lecture
Excel training	<b>Wed. Oct. 8</b> , 5:00-6:50 pm	2525 Phelps	Thursday <b>Oct. 16</b>
USGS hydro-logic data	<b>Wed. Oct. 15</b> , 5:00-6:50 pm	2525 Phelps	Thursday <b>Oct. 23</b>
Rainfall runoff	<b>Wed. Oct 22</b> , 5:00-6:50 pm	<b>3610 Ellison</b>	Thursday October 30
Field work	Preparation: <b>Wed. Oct. 29:</b> 5:00-6:50 pm <b>Saturday Nov. 1; 10 am – 3 pm</b>	2525 Phelps  <b>Field site</b>	  <b>Thurs. Nov. 13</b>
Model TR55	<b>Wed. Nov. 12</b> , 5:00-6:50 pm;	2525 Phelps	Thursday <b>Nov. 20</b>

**Thursday December 11 is the last day of classes. UCSB holidays: November 27 Thanksgiving**

## GRADING

ITEM	DATE/TIME	WEIGHT
		(%)
Examination 1	<b>Thursday</b> , Oct. 30 in lecture room	15
Examination 2	<b>Tuesday</b> November 25 in lecture room	15
Homework	Approx. weekly (7 to 8 see note 3)	18
Laboratory	see note 4	26
Final Examination	<b>Tuesday December 16</b> <b>8 am- 11 am</b> , in lecture room	26
		100

**NOTE: a battery powered, hand, calculator with scientific functional capabilities is need during the examinations.**

**COURSE OBJECTIVES:**

Geography 112 is an introduction to hydrologic science and the analysis of hydrologic processes. The main objective of the course is to teach the student to think critically of watersheds as systems within which water, energy, sediment, and chemicals are cycled according to well-defined principles. The course is intended to teach the student how to conceptualize the hydrologic cycle at the surface of the earth in terms of fundamental conservation laws. A second objective of the course is to teach the student to apply basic principles to formulate and solve a variety of problems that arise in hydrology and which have implications for water resources management. In this course, the student is challenged to integrate and master basic hydrologic principles and to acquire the essential tools to pursue advanced studies or professional work in hydrology and water resources.

**NOTES:**

- 1. Course grade and steady attendance have been found to be positively correlated in the past.**
- 2. Turn off your electronic communication devices during lectures hours, laboratories, and examinations.**

3. **Late homework and reports will NOT be accepted.** All homework and laboratory reports are due the assigned date at the start of class. **Emailed homework or lab reports are NOT acceptable.** Turn homework to the Teaching Assistant and reports to the Instructor. Make-up homework or examinations will not be administered unless a valid and certified medical excuse is presented to the instructor and approved by him depending on the circumstances surrounding each case. The dates of examinations are definitive and will not be modified under any circumstance.
4. **About the laboratory. Attendance is required to all laboratory events to receive any credit.** The laboratory includes the following: (1) **Introduction to Excel laboratory.** Students will be introduced to basic operations with the spreadsheet Excel, which shall prove useful in problem solving and report preparation. (2) **USGS data analysis.** The students will be introduced to the USGS National Water Information System (NWIS) database online. Peak flow data will be downloaded and analyzed statistically. (3) **Field work laboratory.** The field work will be held at Field Site (Rattlesnake Creek), Santa Barbara. River cross-sections and channel bed will be surveyed and a rating discharge curve will be developed. Students will be assigned to work in groups of five or six students which will be chosen by the instructor. Transportation will be provided by UCSB, if needed. No personal vehicles or pets are allowed in the field work. There will be one preparatory meeting to explain how to do the field work and assign the work groups. Attendance **is required** to this event. Field data collection for the Field Site project will be done collectively by each group. Each group will have a designated leader which will organize the work conducted by his/her group under the overall supervision of the Instructor. Each student must write and turn in a written, individual, report plus field data notes according to specifications given by the Instructor. (4) **Rainfall runoff laboratory.** Students will conduct rainfall-runoff laboratory simulation to measure runoff and baseflow in a sand bench produced by artificial rain in room **3610** Ellison Hall (**Hydrology Laboratory**). (5) **Computer TR55 laboratory.** The **computer practice** involves applying the Natural Resources Conservation Service model TR 55. Instructions on how to prepare the report will be given during the execution of the laboratory practice. Grading for the laboratory is as follows:

Laboratory	Weight
Excel practice	2
Field Work	12
USGS data analysis	4
Rainfall-runoff	4
Computer (TR55)	4
<b>Total</b>	<b>26</b>

#### COURSE OUTLINE

WEEK	TOPIC	Tentative week
1	Hydrologic cycle, basic concepts, Dimensional analysis	Weeks 1, 2 Week 1
2	Energy-water, climate concepts	Weeks 3, 4
3-4	Atmospheric moisture and precipitation + snow	Week 4 Week 5, 6
5-7	Evapotranspiration/ Water in soils/infiltration	Week 6, 7 Week 8
8-9	Streamflow Basin geomorphology	Week 9
10	Catchment studies: special topics	Week 10