

Econ *369: Problem-based Learning: Using Data Analytics Health & Environment in Urban Nepal

(Analytical approach to problem solving through the blending of *natural sciences, social sciences, and humanities*)

Fall 2019, Instructor: Dr. Alok K. Bohara, Department of Economics
(Bohara@unm.edu) T,Thr: 11:00AM-12:15PM, Room 1004 (Limited computer lab capacity.) Pre-requisite: Stat 145 (Contact Dr. Bohara for override requests.)

A New Experiential Learning Model: *Taking Classroom to the Field*

Developed by the [Sustainable Development Action Lab](#) of the Nepal Study Center, UNM:

- **Analyze:** Analyzing the real-world data collected on the ground using analytical tools and several **empirical modules** (e.g., graphs, charts, & statistical analysis using STATA).
- **Deliberate:** Collaboratively work with other students in an interdisciplinary fashion to discover *causal* and/or *correlational* linkages and offer practical solutions in one or more of the following areas: sustainable technologies, awareness curricular interventions (citizen science toolkits), citizen science apparatus, environmental dash board, informational App, riparian habitat conservation designs or evidence-based public policy prescriptions. It will evolve as the class progresses. Students are encouraged to be creative in their effort to offer “solutions” and promote community engaged research that benefit the communities. This class encourages creative endeavors.
- **Implement:** If interested, students will have an opportunity to go on a Winter-Session Study Abroad trip for three weeks to Nepal, and implement some of the solutions on the ground in collaboration with our [international partners](#). We (a group of UNM students) did exactly that in December of 2017 and 2018 by setting up a citizen science lab in Siddharthanagar, Nepal. See our success story: <http://news.unm.edu/news/unm-students-help-citizen-science-initiative-in-nepal> You have an opportunity to add to that effort to give it a continuation.
- **Disseminate:** Research outcome (e.g., research posters) can then be presented at the on-and-off campus conferences. See example of the past event and the study abroad activities:
<http://nepalstudycenter.unm.edu/SustainableResearchLab/StudyAbroad.html>

What's New?

The Citizen Science Lab our UNM team established in Siddharthanagar in December 2017 and 2018 has begun to generate time series and cross-sectional environmental data (air quality, weather, water quality –school sites, and river stage).

Encouraged by these developments, the state government has just issued some more air pollution installations.

A nearby community and its village councils have just signed an MOU with our local partner organization to declare a pair of river-side community forests into an Urban Forest and Wildlife Refuge. Taking this as a learning laboratory, we can now implement what we can learn in the classroom.

Course Outline

This course offers a problem-based learning (PBL) environment that brings real world problems. Currently, we will be analyzing three types of data/issues:

- Water Quality and Health Outcome (& linking to related factors)
- Household Waste Management
- Air Pollution and Health Implications

These datasets come with numerous socio-economic, behavioral and knowledge-related information as well as their surrounding and built-environment.

That is, using the real-world data from the ground, students will use statistical software and visualization tools to unravel potential linkages. In a group setting, students can also deliberate and think about solutions and develop conceptual framework for intervention programs (e.g., environmental awareness, personal sanitation), encourage evidence-based decision making (e.g., riparian zoning), suggest and/or develop appropriate technology (e.g., water filtration, awareness App), help develop scientific tools and protocols (e.g., data gathering techniques through school curriculum or citizen science –e.g., [BEMP](#)), for a possible implementation in the field –[DEM](#)P (e.g., through student club).

Approach

Group Collaboration

Student will work in groups to go through several **data analytical modules**. For each module, students will 1) READ relevant literature, 2) ANALYZE *baseline* data to understand the problem and potential linkages, and 3) WRITE a group mini research report, which includes a policy and/or intervention propositions.

Analytical Tools

Students will learn to use 1) survey data, 2) visualization tools in STATA software, 3) statistical methods, 4) GIS mapping tools (if time permits), and 5) collaborative writing through Google doc. To prepare research posters.

Learning Outcomes

Students will be able to (1) use statistical software (STATA) to analyze the real-world data, 2) review existing literature across different disciplines to understand linkages between variables from different interdisciplinary angles, 3) learn to use Stata to perform visualization and statistical testing tools to unravel potential associations, (4) analyze and synthesize empirical work in a group setting for the purpose of recommending and/or designing policy prescriptions in specific contexts, 5) Write research posters and present in the classroom, 6) be critical thinker to propose “solutions” based on the analytical evidence.

Assessment & Grading

- Empirical Modules (20%)
- Synthesizing Results: (Reading, Writing, & Analyzing) Research Notes, Presentation, & Participation (30%)
- In-class and/or Take-home exams (20%)
- Final Research Posters and Presentation (30%)

Useful Links:

Study Abroad

<http://nepalstudycenter.unm.edu/SustainableResearchLab/StudyAbroad.html>

Our Past Community Engaged Research (Citizen Science Lab) Work

<https://foxc01.wixsite.com/yogdan/projects>

Student Blog

<https://foxc01.wixsite.com/yogdan/projects>