

## **Preliminary Course Information**

**CEE 177L/277L: “Smart Cities and Communities”**

**Summer Quarter 2017**

**Mondays & Wednesdays 11:30 am – 1:20 pm, Classroom tba**

**3 units (Letter or Credit/No Credit)**

Principal Instructor: Rich Lechner

### **Course Outline**

Over half the world’s population (and growing) now live in cities; and the top 100 cities account for 25% of the world’s GDP. Because they concentrate people and activity, cities concentrate the adverse impacts that mankind is having on the environment, and they also concentrate risk from climatic or seismic events. Yet paradoxically, cities are more resource-efficient and more innovative per capita, and their very concentration provides tremendous leverage if we wish to improve lives and manage our impact on the planet.

A city is essentially an organism – a complex system of systems. Smart cities enhance livability, workability & sustainability by leveraging methodological & technical innovations to allow those systems to work synergistically with each other and to interact more effectively with the inhabitants. The “mesh” of data and information through which we understand the world is getting smaller. There are more sensors “out there” (and probably in your pocket or your car and around your house) than ever before. They are reporting ever more frequently. Our ability to analyze the resulting flood of data is also greater than ever before, and only increasing. The result is an unprecedented opportunity to optimize the operations of cities – energy, water, transportation systems, food supply, urban design, social services, resilience and much more. Systems of engagement provide new ways to enable “the governed” to connect with their governments and actively participate to a greater degree than ever before. The potential benefits include significant improvements in sustainability, resiliency, efficiency, efficacy, economic & social vitality, and overall quality of life.

This course will explore the smart city, and the IT that underpins it. It will discuss what IT can and cannot do, and most importantly given the control and privacy implications of many “smart” IT systems, what the smart city *should* and *should not* do. In this context, smart cities are a deeply political and social construct, so there are rarely “right” answers – the course is designed to build awareness of the potential for IT to improve the interactions between mankind in cities and the planet, and the potential for harm. Students are encouraged to think: the course will be successful if you leave with more questions than you started with!

The course will provide you with an understanding of the foundational elements of a smart city and the full breadth of systems that comprise it. This is a 3 unit course comprised of two 2 hour sessions per week (90 minutes of lecture and 30 minutes of group discussion). There will be a panel discussion highlighting experts from the public and private sector and there will also be guest lecturers.

No prior knowledge of IT is required, but you will benefit from an interest in the application of information and IT to social and business issues. Classes will be a mix of lecture and group exploration. Grades will be based on written work, a team project, and class participation.

### **Course Methods and Logistics**

Extensive time will be allowed for discussion. Some pre-reading will be set for some modules; and students will be asked to think in advance about issues to be discussed. At all times, students will be encouraged to supply examples of their own of the issues and solutions being discussed on the course.

Students will be expected to actively participate in the course and the level of participation will impact final grades. Contributions can take many forms including: participation in classroom discussions, responding to blog posts by fellow students, or finding & posting relevant articles/stories to the class reading list.

There is an enrollment limit of 50 students in this course. Access will maintain a short waiting list should the limit be reached before the final study list deadline.

### **Assignments**

Class assignments are based predominantly on written essays, to test your ability to explore, adapt and critique the ideas behind smart cities. Assignments will be required as follows:

- One short position paper of ~750 words (worth 20% of grade).
- One deep analysis essay of 2,500 words (worth 50% of total grade).
- One group project which will culminate in either a 30 minute joint presentation or a research poster (20% of total awarded based on individual contribution and overall quality of the team effort).
- 10% of total awarded for contribution, orally in class; or if you prefer via a short (200 words) posts to the Canvas discussion forum which can consist of module critiques, additional insights, related discussion topics.

Topics for the assignments will be provided in the first session, but subject to instructor/TA approval you may also develop your own topics.

## **About Me: Rich Lechner**

I held a number of senior leadership positions at IBM in business development, marketing, sales, and product development across the hardware, software, and services organizations. As vice president of Energy & Environment at IBM, I was responsible for launching a business segment with revenues in excess of \$4B across IBM's broad sustainability portfolio including energy efficient IT, intelligent buildings, smart urban infrastructure, and optimization of operations for energy, carbon, water, and waste. My responsibilities included strategy, marketing, portfolio management, ecosystem development, and sales enablement. In this role, I had the privilege of working with hundreds of organizations around the world to help them address the issues and opportunities around energy, the environment, and sustainability. This will be my second year teaching Smart Cities and Communities within the SEWSS program. Previously, I was an adjunct professor at Columbia University's Earth Institute for Environmental Sustainability for four years.

I look forward to meeting you in the Smart Cities and Communities course!

Rich Lechner

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