LA 410/510 Human Health and the Design of the Urban Microbiome

COURSE CALENDAR

Date	Topic	Description	Reading Due	Media Resource	Assignment / In-Class Activity
7-Jan	general	Introduction: Discuss course requirements and expectations. Talk about what this nascent MoBE field is all about and why we are interested in it. Begin building a common context and vocabulary. Describe a "microbial moment." Discuss Jessica's TED Talk (February 2013).	*Green (2014)* *Sprockett (2014)*	https://www.ted.com/talks/jessica_green_good_germs_make_healthy_buildings?language=en https://www.ted.com/talks/jessica_green_are_we_filtering_the_wrong_microbes	Reflections are due every week. They should respond to the reading(s) and include sketches, diagrams, models or other design tools that show application potential of the research. Readings are available on Canvas.
14-Jan	biology health	Winogradsky columns: In small groups (2-3) collect swab samples, build columns, hypothesize about expected results. Discuss the changing perspective of microbes (e.g., holobiont theory, hygiene/biodiversity hypotheses, human/microbe coevolution). Dispel common misconceptions.	*Blaser and Falkow (2009)* *Gilbert et al. (2012)** *Rook (2010)*	https://www.ted.com/talks/jonathan_eisen_meet_your_microbes	Reading reflection due Prepare Winogradsky columns & develop hypotheses
21-Jan	architecture landscape	History: Slideshow of design/health trajectory, Vitruvius, Hippocrates, Nightingale, Olmsted, Aalto, Corbu. Discuss the role of designers in promoting/protecting public health. How will it fit in with our response to climate change? Is health more/less important than the environment?	*Corburn (2007)** *Fisher (2010)* *Hobday and Dancer (2013)*		Reading reflection due Sketch "magnets"
28-Jan	biology landscape	Landscape: Overview of Parks/Lots pilot study and current outdoor urban sampling. Discuss built environment relationship to "natural" environment.	*Hanski et al. (2012)* *Kuo (2013)* *Ruokolainen et al. (2014)**		Reading reflection due Settling dish training & take home petris

4-Feb	biology architecture landscape	Building: Discuss impact of building type/location. Identify initial hypotheses of researchers and compare with reported results. Evaluate how the findings might be applied in a real-world design context.	*Arnold (2014)* *Barberan et al. (2015)* *Ruiz-Calderon et al. (in press)** *Shogan et al. (2013)** *Smith et al. (2013)**	http://www.amnh.org/explore/amnh.tv/(watch)/amnh-live/scicafe-microbes-in-the-house/(category)/32813 https://www.youtube.com/playlist?list=PLOWlK6maMFyywrvzx2HJNEOd9nCK65LKS	Reading reflection due Hypothesis-results evaluation
11-Feb	biology architecture	Building: Guest lecture by Andy Siemens! Discuss infiltration, ventilation type/source/rate, daylighting, spatial networks/connectance, surface type/material. Speculate about architectural strategies that have the most impact on the indoor microbiome (toplighting, stairs vs. elevator, room volume, air changes, open office vs. cells).	*Kembel et al. (2012)** *Kembel et al. (2014)* *Meadow et al. (2014)*		Reading reflection due "Healthy Space Scavenger Hunt"
18-Feb	biology health	Occupant: Guest lecture by Ashley Bateman! Discuss microbial “cloud,” home colonization, infection risk, intimacy. How have changes in our lifestyles (e.g., smaller households, more rooms, public transit vs. private vehicle) affected the way microbes are shared among social networks?	*Lax et al. (2014)* *Meadow et al. (2015)*	http://homemicrobiome.com/gsc13 http://phenomena.nationalgeographic.com/2014/08/28/we-constantly-imprint-our-homes-with-our-microbes/ http://www.npr.org/sections/health-shots/2015/09/22/441841735/wherever-you-go-your-personal-cloud-of-microbes-follows	Reading reflection due Compare different residence types & hypothesize if/how they may have influenced microbes in health-relevant ways; suggest ways to test your hypothesis
25-Feb	biology landscape	Processes: Discuss dispersal/selection, ecological boundaries, niche/microhabitat, and processes that influence microbial community composition and dynamics. Evaluate Winogradsky columns, revise hypotheses, speculate about design/health implications in light of impending changes due to global warming, population growth, etc.	*Martin et al. (2015)* *Rook et al. (2014)*		Reading reflection due Evaluate Winogradsky columns & compare hypotheses with results

3-Mar	architecture landscape	Health Problems / Design Solutions: Based on the topics we've covered, class will have a brainstorming session about health issues such as infectious disease transmission in close quarters (schools, public transportation, etc.) and the rise in auto-immune disorders linked with "disappearing microbiota." This session will form the basis for final charrette. We will also discuss Laura Williams's blog post and upload top reflection questions to microBEnet.	*National Academies of Sciences, Engineering & Medicine (2015)* *Laura Williams's blog post on microBEnet*	http://microbe.net/2015/02/17/microbiomes-of-the-built-environment-in-the-classroom/	Re-review all readings and reflections for charrette brainstorm Bring list of preliminary research questions for microBEnet
10-Mar		NO CLASS DURING REVIEW WEEK			
17-Mar		Final Exam - 8:00 am, Wednesday, March 16th. We will have the final project design charrette during our scheduled exam time.			In teams of two, create provocative conceptual designs for the "New Health Machine," an iconic building/urban design style with an expressive health-promoting character

*Note: Readings marked with an asterisk are required for grads and optional for undergrads.