TEL AVIV UNIVERSITY אוניברסיטת תל אביב

Full Syllabus

Course Title

Sustainable food production in drylands: challenges and opportunities (course nr: 0920.4001.01)

Lecturer

Associate Prof Jerke W. de Vries, Dr Alon Shepon and Guests

Semester

Spring 2022

Course requirements

Attendance - Participation in at least 11 lectures.
Scientific reading
Final assignment that investigates dryland food systems and gives an outlook on future opportunities (less than 5000 words).
Presentation of projects by each student will take place at the end of the course.

Final grade components

Final assignment - 75%
Presentation in class - 25%

Course schedule

Class no. / Date	Subject	Learning goals	Instructor	Academic readings	Final project
1. 23.2.22	Introduction to the course	- Understand set-up of course	Jerke De Vries Alon Shepon	(Godfray et al., 2010); (van Dijk et al., 2021)	

	and requirements + global food security	- Get broad overview - Explore general theme			
2. 2.3.22	Environmental impact of food systems part 1: sustainability and LCA	- Understand the main impacts related to food - Understand the quantification of it - Understand the basis of LCA	Jerke De Vries	(Poore and Nemecek, 2018); (Garnett, 2014) https://www.youtube.com/watch?v=VUNmN_bZNsk www.greeningthedesertproject.org http://www.restorationag.com/	
3. 9.3.22	Environmental impact of food systems part 2: application of LCA in food systems	- Understand steps in LCA - Apply simple calculations	Jerke De Vries	(Cucurachi et al., 2019); (Shepard, 2013)	
4. 16.3.22	Design of novel food systems:	- Understand how to set up criteria for design	Jerke De Vries	(Hitchin, 2014) (Avni et al., 2019) (Avriel-Avni et al., 2019) (Branch and Wulfmeyer, 2019)	

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	criteria and designs	- Designs of various food systems			
5. 22.3.22	Excursion to the Negev	- Insight into real-life production systems			
6. 30.3.22	Food systems and the desert: current low-tech and high-tech systems	- Current systems in dryland food production	Jerke De Vries	https://www.youtube.com/watch?v=VUNmN_bZNsk www.greeningthedesertproject.org	
7. 6.4.22	Q&A assignment		Jerke De Vries		
8. 10.4.22	Desert environments		Dr Dilia Kool	(Burchi et al., 2011); (Bahadur Kc et al., 2018)	
9. 27.4.22	Food systems and the desert: indigenous knowledge		Prof Pedro Berliner	(Tal, 2007) Agriculture in the Negev: https://www.youtube.com/watch?v=VUNmN_bZNsk	

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10. 11.5.22	Merging knowledge towards sustainable solutions		Dr Alik Pelman	https://www.youtube.com/c/AlikPelman/videos?app=desktop https://www.shenkar.ac.il/en/people/pelman-alik	
11. 18.5.22	Socio-economic and policy implications for desert environments		Prof Shimon Rachmilevech		
12. 25.5.22	Presentations of assignments				
13. 1.6.22	Presentations of assignments				
14. 8.6.22	Presentations of assignments				

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Required course reading

Avni, Y., Avni, G., Porat, N., 2019. A review of the rise and fall of ancient desert runoff agriculture in the Negev Highlands - A model for the southern Levant deserts. J. Arid Environ. 163, 127–137. https://doi.org/https://doi.org/10.1016/j.jaridenv.2019.01.010

Avriel-Avni, N., Avni, Y., Babad, A., Meroz, A., 2019. Wisdom dwells in places: What can modern farmers learn from ancient agricultural systems in the desert of the Southern Levant? J. Arid Environ. 163, 86–98. https://doi.org/https://doi.org/10.1016/j.jaridenv.2018.11.009

Bahadur Kc, K., Dias, G.M., Veeramani, A., Swanton, C.J., Fraser, D., Steinke, D., Lee, E., Wittman, H., Farber, J.M., Dunfield, K., McCann, K., Anand, M., Campbell, M., Rooney, N., Raine, N.E., Van Acker, R., Hanner, R., Pascoal, S., Sharif, S., Benton, T.G., Fraser, E.D.G., 2018. When too much isn't enough: Does current food production meet global nutritional needs? PLoS One 13, 1–16. https://doi.org/10.1371/journal.pone.0205683

Branch, O., Wulfmeyer, V., 2019. Deliberate enhancement of rainfall using desert plantations. Proc. Natl. Acad. Sci. U. S. A. 116, 18841–18847. https://doi.org/10.1073/pnas.1904754116

Burchi, F., Fanzo, J., Frison, E., 2011. The role of food and nutrition system approaches in tackling hidden hunger. Int. J. Environ. Res. Public Health 8, 358–373. https://doi.org/10.3390/ijerph8020358

Cucurachi, S., Scherer, L., Guinée, J., Tukker, A., 2019. Life Cycle Assessment of Food Systems. One Earth 1, 292–297. https://doi.org/10.1016/j.oneear.2019.10.014

Garnett, T., 2014. Three perspectives on sustainable food security: Efficiency, demand restraint, food system transformation. What role for life cycle assessment? J. Clean. Prod. 73, 10–18. https://doi.org/10.1016/j.jclepro.2013.07.045

Godfray, H.C.J., Beddington, J.R., Crute, I.R., Haddad, L., Lawrence, D., Muir, J.F., Pretty, J., Robinson, S., Thomas, S.M., Toulmin, C., 2010. Food security: the challenge of feeding 9 billion people. Science 327, 812–8. https://doi.org/10.1126/science.1185383

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Hitchin, P., 2014. Greening the desert [Sustainability Desert Farming]. Eng. Technol. 9, 82–85. https://doi.org/10.1049/et.2014.0616

Poore, J., Nemecek, T., 2018. Reducing food's environmental impacts through producers and consumers. Science (80-.). 360, 987 LP – 992. https://doi.org/10.1126/science.aaq0216

Shepard, M., 2013. Restoration Agriculture - Real World Permaculture for Farmers. Acres U.S.A., Austin, Texas, USA.

Tal, A., 2007. To Make a Desert Bloom : The Israeli Agricultural Adventure and the Quest for Sustainability. Agric. Hist. 81, 228–257.

van Dijk, M., Morley, T., Rau, M.L., Saghai, Y., 2021. A meta-analysis of projected global food demand and population at risk of hunger for the period 2010–2050. Nat. Food 2, 494–501. https://doi.org/10.1038/s43016-021-00322-9

Optional course material

How to give a good talk, Uri Alon, 2009, Molecular Cell, 36, 2, 165-176
How to give a great scientific talk, 2018, Nic Fleming, Nature
Three tips for giving a great research talk, 2019, Lewis et al, Science

Comments

The curriculum may change depending on material covered in class or other relevant topics that students may be interested in.
The assignment must be submitted by 6.7.22.