OSM Lab Boot Camp Topic Schedule: 2017

University of Chicago, Saieh Hall, Room 247
June 19 to August 4, 2017

			Math Lectures (8:00-9:50am)			Econ Lectures (10:00-11:50am)			Computation Labs (8:00am to noon)			Lunch Speaker (noon to 1:30pm)	
Wk	Date	Day	Topic	Instructor	Source	Topic	Instructor	Source	Topic	Instructor	Source	Topic	Instructor
	19-Jun	Mon	Introduction	Sargent		Overlapping generations	Evans						
	20-Jun	Tue							Python standard library, functions,	Gardiner			
1	21-Jun	Wed	Probability theory	Schmedders	HJ, Ch. 3	Overlapping generations	Evans						
	22-Jun	Thu							Read in, reshape, describe data,	Gardiner			
	23-Jun	Fri	Probability theory	Schmedders	HJ, Ch. 3	Overlapping generations	Evans					Open Source CAD	Casey Mulligan
	26-Jun	Mon	Inner product spaces	Boyd	HJE, Ch. 3	Dynamic programming	Stachurski						
	27-Jun	Tue							Data visualization	Gardiner			
2	28-Jun	Wed	Inner product spaces	Boyd	HJE, Ch. 3	Dynamic programming	Stachurski						
	29-Jun	Thu							Scipy, stats, root finders, minimizers	Gardiner			
	30-Jun	Fri	Inner product spaces	Boyd	HJE, Ch. 3	Dynamic programming	Stachurski					TBA	TBA
	3-Jul	Mon	No classes			No classes			No classes				
	4-Jul	Tue	U.S. holiday, 4th of July			U.S. holiday, 4th of July			U.S. holiday, 4th of July				
3	5-Jul	Wed	Spectral theory		HJE, Ch. 4	Firm Dynamics	DeBacker						
	6-Jul	Thu							Complexity, sparse matrices, SVD	Gardiner			
	7-Jul	Fri	Spectral theory		HJE, Ch. 4	Firm Dynamics	DeBacker					Open Source Policy	Matt Jensen
	10-Jul	Mon	Continuous optimization		HJ, Ch. 6	Firm Dynamics	DeBacker						
	11-Jul	Tue							LU, QR decompositions, eigenvalue	Gardiner			
4	12-Jul	Wed	Continous optimization		HJ, Ch. 6	Structural Estimation: MLE	Evans					TBA	Lars Hansen
	13-Jul	Thu							numerical derivatives, integration	Gardiner			
	14-Jul	Fri	Convex analysis		HJ, Ch. 7	Structural Estimation: GMM	Evans						
	17-Jul	Mon	Convex analysis		HJ, Ch. 7	Structural Estimation: SMM	Evans						
	18-Jul	Tue							Large data methods, distributed I/O,	Gardiner			
5	19-Jul	Wed	Convex analysis		HJ, Ch. 7	DSGE modeling	Phillips						
	20-Jul	Thu							Machine learning	Scheidegger			
	21-Jul	Fri	Linear optimization		HJ, Ch. 8	DSGE linear approximation	Phillips					TBA	TBA
	24-Jul	Mon	Linear optimization		HJ, Ch. 8	Perturbation methods, higher order	Phillips						
	25-Jul	Tue							HPC/Parallel computing	Scheidegger			
6	26-Jul	Wed	Linear optimization		HJ, Ch. 8	Filtering and cyclicality	Phillips						
	27-Jul	Thu							HPC/Parallel computing	Scheidegger			
	28-Jul	Fri	Nonlinear optimization		HJ, Ch. 9	Macro Financial Modeling	Evans					TBA	TBA
	31-Jul	Mon	Nonlinear optimization		HJ, Ch. 9	Macro Financial Modeling	Tsyrennikov						
	1-Aug	Tue							HPC/Parallel computing	Scheidegger			
7	2-Aug	Wed	Nonlinear optimization		HJ, Ch. 9	Macro Financial Modeling	Tsyrennikov						
	3-Aug	Thu							HPC/Parallel computing	Scheidegger			
	4-Aug	Fri	Concluding lecture: All homework due			Concluding lecture: All homework due			Concluding lecture: All homework due				
			19 lecture periods	32 hours		19 lecture periods	32 hours		13 lab periods	52 hours			

Computational set up: Students should have completed basic Python, git, and LaTeX tutorials before beginning the Boot Camp. Students should have the Anaconda distribution of Python loaded on their machines

Coursework Prerequisites:

Math: Linear algebra, multivariable calculus, real analysis
Economics: Core undergraduate microeconomics (calculus based, constrained optimization)
Statistics: Econometrics, probability theory
Computation: Some experience (coursework or other) programming in a full-scale programming language

Tutorials and Python labs to complete before camp begins:

LaTeX tutorial
Git and GitHub.com tutorial
Install Anaconda distribution of Python
Beginning Python lab notebooks

References

[HJ (2017)] Humpherys, Jeffrey and Tyler J. Jarvis, Foudations of Applied Mathematics, Volume II: Algorithm Design and Optimization, SIAM (forthcoming).
[HJE (2017)] Humpherys, Jeffrey, Tyler J. Jarvis, and Emily J. Evans, Foundations of Applied Mathematics: Volume I: Mathematical Analysis, SIAM (forthcoming).