

Some suggestions for further reading for part I, first order equations

## References

- [1] R. J. LeVeque. Numerical methods for conservation laws. Birkhäuser, 1992.  
very nice introduction into this topic with many examples (physics, traffic flow, convex and nonconvex flux functions)
- [2] Chechkin, Gregory A.; Goritsky, Andrey Yu. S.N. Kruzkov's lectures on first order quasilinear PDEs in: Analytical and numerical aspects of partial differential equations. E. Emmrich and P. Wittbold, de Gruyter 2007–2009. Preprint: [www.math.ntnu.no/conservation/2009/011.pdf](http://www.math.ntnu.no/conservation/2009/011.pdf)  
very nice introduction into the field, many exercises, convex and nonconvex flux functions, different motivations for/derivations of entropy conditions
- [3] L. C. Evans. Partial Differential Equations, volume 19 of Graduate Studies in Mathematics. American Mathematical Society, Providence, RI, 1998.  
among others: scalar conservation laws with convex flux function, spatially 1 dim., existence of solutions by explicit formula, proof of uniqueness of (entropy) solutions, several equivalent entropy conditions
- [4] J. Smoller. Shock waves and reaction-diffusion equations. Grundlehren der Mathematischen Wissenschaften. 258. Springer-Verlag, 1994.  
among others: scalar conservation laws with convex flux function (one-dim), existence and uniqueness of entropy solutions (existence via time-discretization)
- [5] G. Warnecke. Analytische Methoden in der Theorie der Erhaltungsgleichungen. Teubner-Texte zur Mathematik. Stuttgart: Teubner, 1999.  
measure valued solutions, vanishing viscosity method.
- [6] D. Kröner. Numerical schemes for conservation laws. Wiley-Teubner Series Advances in Numerical Mathematics. Chichester: Wiley. Stuttgart: Teubner, 1997.  
spatially 1 or 2-dimensional, reference to Kruzkov's methods
- [7] F. John. Partial differential equations. App. Math. Sciences, Vol. 1. Springer, 1982.  
among others: quasilinear and fully nonlinear equations of first order, local existence theorems,
- [8] J. Jost. Partielle Differentialgleichungen. Springer, Berlin, 1998.
- [9] M. Renardy, R. C. Rogers. An introduction to partial differential equations. Springer, 2004.
- [10] C. Eck, H. Garcke, P. Knabner. Mathematische Modellierung Springer, 2008. among others: mathematical modeling/derivation of different kinds of equations (as the title says)