Suggestions for further reading:

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. Kruzkovs 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
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] 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,

[5] J. Jost. Partielle Differentialgleichungen. Springer, Berlin, 1998.

[6] M. Renardy, R. C. Rogers. An introduction to partial differential equations. Springer, 2004.

[7] C. Eck, H. Garcke, P. Knabner. Mathematische Modellierung Springer, 2008. among others: mathematical modeling/derivation of different kinds of equations (as the title says)