



## PROBABILITY SEMINAR

# A Generalized Neyman-Pearson Lemma

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**Abstract.** The Fundamental Neyman–Pearson Lemma is a well known key result in hypothesis testing theory both by theoretical purposes as for statistical applications. It provides a complete characterization of all reasonable statistical tests to confront two simple hypothesis. In this talk, we will address a less known version of this theorem that is suitable to more general settings than the restrictive two simple hypothesis situation. We will see as ingenious uses of concepts and results from probability theory, functional analysis, abstract integration theory and convex analysis lead to this important result.

## References

- [1] Barra, J.-R. and Herbach, L., Mathematical Basis of Statistics, Academic Press (1981).
- [2] Keener, R. W., Theoretical Statistics: Topics for a Core Course, Springer (2010).
- [3] Lehmann, E. L. and Romano, J. P., Testing Statistical Hypothesis, Springer (2005).
- [4] Rockafellar, R. T., Convex Analysis, Princeton University Press (1970).