

RSM Simplified: Optimizing Processes Using Response Surface Methods for Design of Experiments, Mark Anderson and Patrick Whitcomb, Productivity Press, 2005.

RSM, Responsive Surface Methods is an empirical method to explore the responses of multivariate control variables via design of experiments. The idea is not very complicated, simply stated, RSM is using experimental data to build up an empirical quantitative functional relationship between the predict variables and the responses, so with the understanding of these relationship, parameters can be characterized and optimized.

To help the readers to understand the subject without bog down in the nitty-gritty statistical rigor, the authors adopted a straightforward narrative style of showing example of building a simple one variable functional relationship between the departing time from home and the travel time to the office. The first two chapters address some key issues of model building, or equivalently, a crash course in regression analysis. The statistical terms and concepts are introduced freely and casually, when and where it needed.

The Design of Experiments to generate the Responsive Surfaces are discussed in chapters 3, factorial experiments with central points, chapter 4, CCD , Central Composite Design, and chapter 5 Box-Behnken three-level designs. Chapter 7 provides a quick review of D-Optimal Designs, which are usually, generated by computer, and chapter 11 for Mixture Design, which usually, addressing the composition ratios among the component ingredients.

This book also provides a student version of Design-Expert 7.0 CD-ROM. It is good for 180 days, and it should be good enough for a semester's learning.

This book will be a good introductory material for quality and six sigma professional who need to learn a tool (or two) on how to identify a critical process parameters and to optimize processes.

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