Contents

1.	Introduction and preliminaries 1
	1.1. Equations of the first kind; ill-posed problems
	1.2. Linear operators in Hilbert space 5
	1.3. Generalized inverses 11
	References 14
2.	A general regularization method 15
	2.1. Convergence results 15
	2.2. Convergence rates 18
	2.3. Regularization with inexact data 21
	2.4. Some examples 26
	References 29
3.	Tikhonov regularization 31
	3.1. Tikhonov's method 31
	3.2. Saturation and converse results 37
	3.3. The discrepancy principle 43
	3.4. Use of differential operators 52
	References 61
4.	Finite dimensional approximations 64
	4.1. Finite rank approximations 64
	4.2. A regularized Ritz approach 73
	4.3. Marti's method 83
	4.4. Moment discretization and cross validation 86
	References 98
	List of symbols 101
	Subject index 103