

Contents

CHAPTER 1	<i>Introduction</i>	
1.1	Preliminary Notation	1
1.2	The Ordinary Differential Equation	4
1.3	An Existence and Uniqueness Theorem	8
1.4	The Maximum Interval of Existence	10
	Problems	13
CHAPTER 2	<i>The Linear Equation: General Discussion</i>	
2.1	Introduction	15
2.2	Fundamental Solutions	17
2.3	The Wronskian	21
2.4	The Nonhomogeneous Linear Equation	25
2.5	The n th-Order Linear Equation	28
2.6	The Nonhomogeneous n th-Order Linear Equation	33
	Problems	37
CHAPTER 3	<i>The Linear Equation with Constant Coefficients</i>	
3.1	The n th-Order Linear Equation	41
3.2	The Nonhomogeneous n th-Order Linear Equation	51
3.3	The Behavior of Solutions	55
3.4	The First-Order Linear System	58
	Problems	65

CHAPTER 4	<i>Autonomous Systems and Phase Space</i>	
4.1	Introduction	68
4.2	Linear Systems—Constant Coefficients	73
4.3	A General Discussion	81
4.4	Nonlinear Systems	84
	Problems	88
CHAPTER 5	<i>Stability for Nonautonomous Equations</i>	
5.1	Introduction	91
5.2	Stability for Linear Systems	93
5.3	Two Results for Nonlinear Systems	99
5.4	Liapunov's Direct Method	105
5.5	Some Results for the Second-Order Linear Equation	111
	Problems	117
CHAPTER 6	<i>Existence, Uniqueness, and Related Topics</i>	
6.1	Proof of the Existence and Uniqueness of Solutions	121
6.2	Continuation of Solutions and the Maximum Interval of Existence	130
6.3	The Dependence of Solutions on Parameters and Approximate Solutions	136
	Problems	141
APPENDIX A	<i>Series Solutions of Second-Order Linear Equations</i>	144
APPENDIX B	<i>Linear Systems with Periodic Coefficients</i>	155
	<i>References</i>	161
	<i>Index</i>	163