

Index

A

Asymptotically Stable *pp.*7, 61 – 62, 67 – 69

B

Bendixson's Theorem *pp.*25 – 29
Bifurcation *pp.*12 – 13
Bifurcation (Fold) *pp.*12 – 13, 57
Bifurcation (Transcritical) *pp.*12 – 15
Bifurcation Diagram *pp.*12, 15 – 17

C

Carrying Capacity *p.*9
Center Manifold Theory *pp.*39 – 45
Centers (Equilibrium Point) *pp.*22, 26
Characteristic Equation *p.*34
Continuity w.r.t. Initial Conditions *pp.*53 – 55
Continuity w.r.t. Parameters *pp.*54 – 55
Continuously Differentiable *pp.*48 – 52
Coordinate Transformation Matrix *pp.*18, 20 – 41

D

Differentiable *pp.*51 – 52
Divergence *pp.*25 – 29

E

Equilibrium Point *pp.*3 – 4
Existence And Uniqueness Theorem *pp.*46 – 52

F

Finite Escape Time *pp.*9 – 10
Focus Node *pp.*22, 33
Fold Bifurcation *pp.*12 – 13, 57

G

Globally Asymptotically Stable *pp.*62, 67
Green's Theorem *pp.*25 – 27

H

Hartman Grobman Theorem *pp.*23 – 24
Homeomorphic *p.*23
Hopf Bifurcation *pp.*35 – 38
Hyperbolic Equilibrium Point *pp.*22 – 24

I

Index Theory *p.*35
Infinity Norm *p.*61
Invariant Manifold *pp.*42 – 45

J

Jacobian *pp.*56 – 58

L

L1 Norm *p.*61
L2 Norm *p.*61
Level Sets *pp.*66 – 69

Limit Cycle	<i>pp.</i> 10 – 12, 33 – 38
Linearization at a Fixed Point	<i>pp.</i> 5 – 8, 23 – 24
Lipschitz Continuous Function	<i>pp.</i> 49 – 55
Locally Asymptotically Stable	<i>pp.</i> 61 – 62, 67 – 69
Logistic Equation	<i>p.</i> 9
Lorenz Attractor	<i>p.</i> 12
Lyapunov Functions	<i>pp.</i> 65 – 69
Lyapunov Stability	<i>pp.</i> 59 – 69
<i>M</i>	
Manifolds, C^k Differentiable	<i>pp.</i> 48 – 52
Metzler Matrix	<i>p.</i> 31
<i>N</i>	
Negative Semidefinite Function	<i>p.</i> 67
Node	<i>pp.</i> 21, 33
<i>P</i>	
P Norm	<i>p.</i> 61
Pendulum	<i>pp.</i> 7 – 8, 63 – 64
Periodic Orbits	<i>pp.</i> 25 – 34
Phase Portrait	<i>pp.</i> 5, 17 – 19
Pitchfork Bifurcation	<i>pp.</i> 12, 15 – 17
Poincare Bendixson Criterion	<i>pp.</i> 32 – 34
Positive Definite Function	<i>pp.</i> 65 – 66
Positive Invariant Set	<i>pp.</i> 21, 29 – 34, 69
Positive System	<i>p.</i> 31
Predator/prey Model	<i>pp.</i> 30 – 31
<i>R</i>	
Radially Unbounded	<i>pp.</i> 67 – 68
Region of Attraction	<i>p.</i> 15
Routh Hurwitz Criterion	<i>p.</i> 34
<i>S</i>	
Saddle Node	<i>pp.</i> 19 – 21
Sensitivity Function	<i>pp.</i> 55 – 58
Sink Node	<i>pp.</i> 19, 21
Source Node	<i>pp.</i> 19, 21
Stability	<i>p.</i> 5
Stable	<i>p.</i> 5
Subcritical Hopf Bifurcation	<i>pp.</i> 37 – 38
Subcritical Pitchfork Bifurcation	<i>p.</i> 17
Supercritical Hopf Bifurcation	<i>pp.</i> 35 – 37
Supercritical Pitchfork Bifurcation	<i>pp.</i> 15 – 16
<i>T</i>	
Taylor Series Expansion	<i>pp.</i> 6, 39 – 40, 44 – 45
Transcritical Bifurcation	<i>pp.</i> 12 – 15
<i>V</i>	
Van Der Pol Oscillator	<i>pp.</i> 11 – 12