# Index


*A*

Asymptotically Stable *p.*7

*B*

Bendixson's Theorem *pp.*25 – 29

Bifurcation *pp.*12 – 13

Bifurcation (Fold) *pp.*12 – 13

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*

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

Invariant Manifold *pp.*42 – 45

*J*

Jacobian *pp.*56 – 58

*L*

Limit Cycle *pp.*10 – 12, 33 – 38

Linearization at a Fixed Point *pp.*5 – 8, 23 – 24

Lipschitz Continuous Function *pp.*49 – 55

Logistic Equation *p.*9

Lorenz Attractor *p.*12

*M*

Manifolds, $C^k$ Differentiable $pp.48 - 52$

Metzler Matrix $p.31$

*N*

Node $pp.21, 33$

*P*

Pendulum $pp.7 - 8$

Periodic Orbits $pp.25 - 34$

Phase Portrait $pp.5, 17 - 19$

Pitchfork Bifurcation $pp.12, 15 - 17$

Poincare Bendixson Criterion $pp.32 - 34$

Positive Invariant Set $pp.21, 29 - 34$

Positive System $p.31$

Predator/prey Model $pp.30 - 31$

*R*

Region of Attraction $p.15$

Routh Hurwitz Criterion $p.34$

*S*

Saddle Node $pp.19 - 21$

Sensitivity Function $pp.55 - 58$

Sink Node $pp.19, 21$

Source Node $pp.19, 21$

Stability $p.5$

Stable $p.5$

Subcritical Hopf Bifurcation $pp.37 - 38$

Subcritical Pitchfork Bifurcation $p.17$

Supercritical Hopf Bifurcation $pp.35 - 37$

Supercritical Pitchfork Bifurcation $pp.15 - 16$

*T*

Taylor Series Expansion $pp.6, 39 - 40, 44 - 45$

Transcritical Bifurcation $pp.12 - 15$

*V*

Van Der Pol Oscillator $pp.11 - 12$