

Index

Subsonic Aerodynamics	1
Principles, laws and definitions	1
Two-dimensional airflow around an aerofoil	24
Coefficients	32
Three-dimensional flow around an aeroplane	36
Total drag	44
Ground effect	52
Relationship between the lift coefficient and airspeed in steady, straight and level flight	55
Airflow separation	56
Increase of $C_{L_{max}}$	73
Devices for reducing the $C_L - C_D$ ratios	82
The boundary layer	83
Deterioration of aerodynamic characteristics	87
High-Speed Aerodynamics	90
Speed ranges	90
Shock waves	98
Effects of exceeding M_{CRIT}	102
Onset of buffet	107
Measures to increase M_{CRIT}	108
Stability	113
Static and dynamic stability	113
Static and dynamic directional stability	117
Static directional stability	133
Static lateral stability	139
Dynamic longitudinal/directional stability	144
Control	148
General	148
Pitch (longitudinal control)	150
Yaw (directional control)	153
Roll (aileron control)	155
Interaction between roll and yaw	157
Measures to reduce control forces	158
Mass balance	160
Trimming	161
Limitations	164
Operational limits	164
Manoeuvring envelope	166
Gust envelope	168
Propellers	171
Conversion of engine torque to thrust	171
Engine failure	177
Design factors affecting power absorption	178
Secondary effects of a propeller	179
Flight Mechanics	182
Forces acting on an aircraft	182
Asymmetric thrust	187
Particular points on a polar curve	191
Keyword Index	195