



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS INSTITUTION – UGC, GOVT. OF INDIA)

**B.Tech
Aeronautical
Engineering**

Department of AERONAUTICAL ENGINEERING



AIRCRAFT PERFORMANCE

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AIRCRAFT PERFORMANCE
(R20A2109)
Course Coverage Summary

| Unit No | Title of the Unit | Topics of the Unit | Name of The Text Book | Chapter No | Page No |
|---------|--|--|--|------------|--------------|
| I | Introduction to Aircraft Performance-The Force Systems of The Aircraft | The Role And Design Mission Of An Aircraft, Specification Of The Performance Requirements And Mission Profile, Importance Of Performance Analysis, Estimation, Measurement, Operational Safety And Economy, The Standard Atmosphere, Off-Standard And Design Atmosphere. Measurement Of Air Data. Air Data Computers | Eshelby, M.E., Aircraft Performance; | I&2 | 1-9 10-37 |
| | | Equations Of Motion For Performance, The aircraft force system, | Aircraft Performance& Design J.D. Anderson | 4 | 191-201 |
| | | The Propulsive Forces - The Thrust Production Engines, Power Producing Engines | Eshelby, M.E., Aircraft Performance; | 3 | 53- 60 |
| | | Variation Of Thrust, Propulsive Power And specific Fuel Consumption With AltitudeAnd Flight Speed | Aircraft Performance& Design J.D. Anderson | 3 | 170-174 |
| II | Cruise Performance | Maximum And Minimum Speeds In Level Flight, Range And Endurance With Thrust Production, And Power Producing Engines. | Aircraft Performance& Design J.D. Anderson | 5 | 293-305 |
| | | Cruise Techniques - Constant Angle Of Attack, Constant Mach Number; Constant Altitude, Methods- Comparison Of Performance, The Effect Of Alternative Fuel Flow Laws, Weight, Altitude And Temperature On Cruise Performance, Cruise Performance With Mixed Power-Plants | Eshelby, M.E., Aircraft Performance; | 4 | 63-83 |

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|-----|---|---|--|---|---------|
| III | Climb and Descent Performance | Climb And Descent Techniques, Safety Considerations, Performance Analysis, Maximum Climb Gradient, Climb Rate, | Eshelby, M.E., Aircraft Performance; | 5 | 84-94 |
| | | Energy Height And Specific Excess Power, | Aircraft Performance& Design J.D. Anderson | 6 | 345-352 |
| | | Optimal Climbs - Minimum Time, Minimum Fuel Climbs, Measurement Of Climb Performance. Descent Performance In Aircraft Operations. Effect Of Wind On Climb And Descent Performance | Eshelby, M.E., Aircraft Performance; | 5 | 95-105 |
| IV | Manoeuvre Performance | Accelerated Motion Of Aircraft - Equations Of Motion- The Manoeuvre Envelope, | Aircraft Performance& Design J.D. Anderson | 6 | 321-341 |
| | | Longitudinal Manoeuvres- The Pull-Up, Push Over Manoeuvres.LateralManoeuvres- | | | |
| | | Turn Performance- Turn Rates, Turn Radius- Limiting Factors. Manoeuvre Boundaries, Manoeuvre Performance Of Military Aircraft, Transport Aircraft | | | |
| V | Take- off and Landing – Safety Requirements _ Flight Planning | Estimation Of Take-Off Distances. The Effect On The Take-Off Distance wrt weight, wind, Runway Conditions, Ground Effect. Take-Off Safety Factors, The Estimation Of Landing Distances, | Aircraft Performance& Design J.D. Anderson | 6 | 353-370 |
| | | The Discontinued Landing, Baulked Landing, Air Safety Procedures And Requirements On Performance. The effect on landing distances of weight ,wind, runway conditions, ground effect, Fuel planning , fuel requirement , trip fuel , reserve and tankering | | | |

