

# Pakistan Space and Upper Atmosphere Research Commission



## Professional Development Short Course ASTRODYNAMICS AND FLIGHT DYNAMICS

May 7-11, 2007

### Course Outline

Day	Date	#	Session Topic	Timings
Monday	May 07	01	<b>Introductory Session</b>	<b>0900-0945</b>
		02	<b>Problem-Solving Techniques</b>	<b>0945-1030</b>
		03	<b>Projectile Dynamics, Orbital and Escape Velocities, Geostationary and Polar Satellites, Satellite-Launch Vehicle (SLV), Satellite and. SLV Orbits</b>	<b>1100-1145</b>
Tuesday	May 08	04	<b>Down-Range and Cross-Range Error for Short-Range Projectiles</b>	<b>0900-0945</b>
		05	<b>Mathematics of Inertial-Navigation and Telemetry Systems</b>	<b>0945-1030</b>
		06	<b>Review of Lagrangian and Hamiltonian Dynamics</b>	<b>1100-1145</b>
Wednesday	May 09	07	<b>Two-Body Problem in the Plane-Polar-Coördinate Mesh</b>	<b>0900-0945</b>
		08	<b>Two-Body Problem in the Elliptic-Astrodynamical-Coördinate Mesh</b>	<b>0945-1030</b>
		09	<b>The Hohmann-Transfer Orbit</b>	<b>1100-1145</b>
Thursday	May 10	10	<b>Control Laws (the Cross-Product, the Extended-Cross-Product, the Normal-Component-Cross-Product, the Dot-Product, the Normal-Component-Dot-Product and the Ellipse-Orientation Steering)</b>	<b>0900-0945</b>
		11	<b>Guidance Schemes (the Delta Guidance, the Lambert and the Inverse-Lambert Scheme, the Q, the Inverse-Q and the Multi-Stage-Q System)</b>	<b>0945-1030</b>
		12	<b>Three-Body Problem and Stability of Satellites</b>	<b>1100-1145</b>
Friday	May 11	13	<b>Problem Discussion/Software Demonstration</b>	<b>0900-0945</b>
		14	<b>Concluding Session (Course Summary)</b>	<b>0945-1030</b>