

## Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2010-TEC-MSS	Structural Engineering	ESTEC
<p><b><u>Overview of the Division missions:</u></b></p> <p>The Structures and Mechanisms Division TEC-MS is the centre of competence of the Agency in all areas related to spacecraft and launcher structures and mechanisms, encompassing spacecraft and launcher lightweight structures, stable structures, advanced mechanical materials applications, structural dynamics, damage tolerance, deployable structures/booms, active structures, hold-down and release devices, electrical motors for space mechanisms, launcher and re-entry hot and cold structures, landing attenuation systems, seals, valves, parachute systems, separation systems, reaction wheels, gyros, bearings and tribology aspects. It provides support to projects, preparatory programs and technology programs. Within this frame, the Structures Section TEC-MSS is in charge of all structural engineering aspects.</p>		
<p><b><u>Overview of the field of activity proposed:</u></b></p> <p style="text-align: center;"><b>Structural Engineering (TEC-MSS)</b></p> <ol style="list-style-type: none"> <li>1. Perform / evaluate instrument / satellite accommodation studies, familiarization with project requirements and CAD tools.</li> <li>2. Perform structural static / dynamic / vibro-acoustic / shock analyses (Nastran, Samcef, Rayon, Dytran, Abaqus), in support to on-going spacecraft and launcher programs.</li> <li>3. Participate to the definition / improvement / verification of structural &amp; configuration analysis tools (including participation to studies performed in the Concurrent Design Facility).</li> <li>4. Perform Fracture Mechanics Analysis and evaluate material properties for manned and unmanned spacecraft (ESACRACK, FRAMES-2).</li> <li>5. Participate to the identification and investigation of possible improvements of composite materials used in spacecraft by the inclusion of nano composite in the matrix.</li> <li>6. Support the development of new technologies for structural design / hot structures concepts and materials/health monitoring concepts for Reusable Launch/Re-entry Vehicles, including related engineering analyses and support to on-going programmes.</li> <li>7. Participate in the definition and post processing of mechanical test programmes, including the development and application of tools for mathematical model correlation / cross-checks between analytical predicted and experimentally identified modes, deflections, strain ).</li> <li>8. Participate in the development and application of the Agency's structural analysis tools (e.g. ESACOMP, Nastran, Samcef) for spacecraft and launcher composites structures, including the evaluation of composite test methods and implementation of relevant interfaces in FRAMES-2, ESACOMP.</li> <li>9. Participate in the development of tools and methodologies for dynamic analysis of spacecraft and launchers, e.g. Coupled Loads Analysis and Shock propagation analysis, low, medium and high frequency.</li> <li>10. Participate to the development of stochastic analysis/design methods, e.g. for the areas of Damage Tolerance, mathematical model correlation, buckling and thermo-elastic stability.</li> </ol>		
<p><b><u>Required Education:</u></b></p> <p>Applicants should have completed a University education at Masters level (or equivalent) in: Aeronautical / Mechanical Engineering, with some knowledge of the topics to be addressed. (e.g. composites, active control, hot structures, fracture mechanics, hyper-velocity, dynamics, non-linear static). Candidates must be fluent in English or French, the official languages of the Agency.</p>		