

## ***NX Nastran Academic Partner Bundle - NXNACAD100***

- **NXN001 NX Nastran Basic** - Provides the underlying foundation product for simulation solution using NX Nastran. It supports a range of commonly used engineering simulations: Linear Static Structural Analysis, Normal Modes for Vibration, Structural Buckling, Steady State and Transient Heat Transfer (linear and non linear), and Basic Nonlinear. It also includes capabilities such as inertia relief, composites modeling, and spot weld elements.

The covered NX Nastran Solution sequences include: 101, 103, 105, 106, 114, 115, 116, 129, 153 and 159.

- **NXN002 NX Nastran Advanced** - Provides support for Dynamic analysis, Aero-Elasticity, DMAP, and super elements. In addition to these advanced capabilities, the bundle also provides support for distributed parallel processing (DMP).

The covered NX Nastran Solution sequences include: 107, 108, 109, 110, 111, 112, 118, 144, 145, and 146.

- **NXN004 NX Nastran Dynamic Response** - Provides an advanced suite of tools aimed at providing users with a flexible tool to analyze the response of models that are subjected to loads that vary with time or frequency.

As such NX Nastran Dynamic Response includes a comprehensive range of response simulation capabilities; normal modes analysis and complex eigenanalysis, frequency & transient response analysis, Accoustic analysis, response and shock spectrum analysis, component mode synthesis and random vibration analysis.

In addition it can be effectively coupled with other analysis types such as Superelements, Non-linear analysis, design sensitivity and optimization.

These solution types can be leveraged for a number of advanced simulation capabilities to analyze more complex phenomena, such as control systems, coupled fluid/structures, Gyroscopic and Coriolis effects and transfer functions for example.

- **NXN005 NX Nastran Aero-Elasticity** - Provides efficient simulation for the interaction of aerodynamic, inertial and structural forces that are prevalent when any structural is exposed to high, static or time dependant, loads due to the effects of an air stream.

A range of static aeroelastic features allow for stress, load, aerodynamic and control system analysis and design using a common finite element representation. In addition to static analysis, simulations can be bolstered with the inclusion of a number dynamic response and flutter simulation methods.

## **Servicios Informáticos DAT, S.L**

- **NXN007 NX Nastran Optimization** - is a capability of NX Nastran that enables customers to outline design sensitivity to simulated performance conditions then synthesize and optimize designs to yield improved designs.

Optimization may be applied to a broad range of NX Nastran basic analysis types of solutions, such as Linear statics analysis, Normal modes analysis, Buckling analysis. In addition it also includes a broad range of optimization capabilities associated with NX Nastran Enterprise Advanced analysis types, such as Superelements, Dynamic Response : Modal frequency response, Direct frequency response, Modal transient response , Acoustic analysis, Static Aeroelasticity and flutter.

- **NXN008 NX Nastran Super Elements** - Provide a method to reduce the complexity and resource demands of large analysis problems. Superelement capabilities can be used in all types of analysis including Statics, normal modes, buckling, transient response, frequency response, heat transfer and non-linear analysis.

The Superelement technique involves breaking down a large structure into a set of smaller substructures known as superelements. The simulation results from Superelements can be processed individually or all at once. These results can then be combined into a final solution, for the model as a whole.

This has the advantage that computer resource requirements are lessened and the entire simulation can be broken into smaller simulation pieces which can be undertaken by different product development groups, without necessarily revealing proprietary modeling information.

- **NXN009 NX Nastran DMAP** - Provides a sophisticated programming language that allows users to expand and customize NX Nastran's capabilities by writing their own applications and installing their own custom modules.

NX Nastran DMAP comes with its own compilers and grammatical rules that are deeply linked into the core capabilities of NX Nastran. In fact each type of analysis in NX Nastran is based on a pre-packaged collection of hundreds or thousands of DMAP commands.

- **NXN010 NX Nastran DMP** - Enables parallel processing using distributed memory. Intended for use on cluster hardware systems, this is a very efficient approach for solving very large models. One license of NX Nastran DMP can be used to spawn a solve over as many processors as wanted.

DMP solutions are available for static solves (SOL 101), modal eigenvalue solves (SOL 103), and modal dynamic response solves (SOL 111 and 112). For the modal solutions, the partitioning can be performed over the frequency domain, geometry domain, or a combination of both.

- **NXN014 NX Nastran Rotor Dynamics** - Enable users to predict the dynamic response of rotating systems such as shafts, turbines, and propellers. The analysis will predict modes of the system as a function of shaft rotational speed and identify the critical speeds of the shaft (i.e. speeds at which the response becomes unstable).

Solution capabilities include: multiple rotors, fixed or rotating coordinate frames of reference, general model types (i.e. does not have to be line model), symmetric or unsymmetrical rotor models. In addition, the solver supports synchronous solutions (solve for rotational speed that is coincident with rotor modes) and asynchronous solutions (solve for modes of rotor as function of varying rotor speed).

- **NXN020 NX Nastran Advanced Nonlinear Solver** - Enables users to address a range of challenging nonlinear simulations involving surface-to-surface contact, large deformation, large-strain, and nonlinear materials.

Material models that can be used are: elastic isotropic, elastic orthotropic, composites, gasket materials, elastic-plastic, hyperelastic, temperature dependent, nonlinear elastic and elastic creep.

Solution capabilities include: static solutions, dynamic solutions, creep analysis, load displacement control, and automatic time stepping. Surface contact capabilities includes: single and double sided, self contact, all contact, friction models, offsets, and rigid and flexible contact surfaces. Both an implicit solver solution (SOL 601) and explicit solver solution (SOL 701) are included.

