

**Mirce Mechanics** is a scientific theory of the motion of functionability through the life of a functional system, resulting from the occurrence of failure phenomena. It is developed at the MIRCE Akademy by Dr Knezevic, who proposed the Axiom that “*The probability of occurrence of failure at any interval of time is greater than zero*”. The main objectives of the research are to:

- Determine the pattern of the motion
- Understand the mechanisms of the motion
- Formulate the laws of the motion
- Compute the motion for a given system.

The above objectives are achieved through the following types of activities:

**Statistical Mirce Mechanics** that focuses on the observation of the patterns of the motion of functionability through the life of a functional system. All observations clearly show the variability in the pattern of the motion of functionability through lives of “identical” systems, while delivering “identical” functions, under “identical” in-service conditions. The variability is related to the type and frequency of occurrence of failure phenomena. Hence, the physically observable measures of the motion of functionability through the life of a functional system are of statistical nature, which requires the use of statistical methods for their statistical descriptions.

**Scientific Mirce Mechanics** that focuses on the understanding of causes of statistical behaviour of the motion of functionability through the life of a functional system, as it is beyond the scope of statistics. Although systems function in accordance to the well understood deterministic laws of classical science they are unable to shine any light on statistical nature of the motion of failure phenomena. However, understandings of the uncertainty principle of quantum mechanics, which defines the laws of nature at atomic and molecular level in probabilistic manner, certainly shine the light on the causes of the statistical behaviour of the motion of functionability, at the system level.

**Probabilistic Mirce Mechanics** that focuses on the mathematical formulation of the laws of the motions of functionability through the life of a functional system. For that purpose Mirce Mechanics mathematical scheme has been created, which enables probabilistic calculations of physically observable measures of the motion. The laws of probability that govern the motion of functionability are equally rigorous as the deterministic laws of classical physics. It is simply that they refer to the probabilities of the occurrence of failure phenomena and predict their collective (average) properties, rather than the properties of the individual failure system.

**Computational Mirce Mechanics** that focuses on the quantitative evaluation of Mirce Mechanics mathematical scheme for a given system and given in-service rules and conditions, as finding solutions to the infinitively-dimensional mathematical scheme is too complex for analytical methods. Consequently, the development of effective computational methods that enable the construction of accurate mathematical representations of the complexity of physical reality of the motion of functionability is required, rather than to be forced to simplify the complexity of the system operational reality in order to deal with mathematical limitations.

**Applied Mirce Mechanics** that focuses on the applications of Mirce Mechanics theory to:

- **System Design Process**, to enable probabilistic, accurate and instantaneous calculations for managing in-service reliability, cost and effectiveness, MIRCE, to be made for each of feasible design alternatives, at the early stages of system design, when changes and modifications are possible at least cost and time.
- **System Operational Process** to enable probabilistic, accurate and instantaneous calculations of managing in-service reliability, cost and effectiveness, MIRCE, to be made for each of feasible management alternatives, at the planning stage of system life, when changes and modifications are possible at least cost and time.

