



# St. Francis Institute of Technology

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Information Technology and Electronics & Telecommunication Engineering are NBA Accredited

## Department of Mechanical Engineering

### COURSE OUTCOMES (COs)

A.Y. 2022-23

Term - ODD

Semester – V

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#### MEC501 – Mechanical Measurements and Controls

MEC501.1	The students will be able to handle, operate and apply the precision measuring instruments/equipment.
MEC501.2	The students will be able to analyze simple machined components for dimensional stability & functionality.
MEC501.3	The students will be able to classify various types of static characteristics and types of errors occurring in the system.
MEC501.4	The students will be able to classify and select proper measuring instrument for displacement, pressure, flow and temperature measurements.
MEC501.5	The students will be able to design mathematical model of system/process for standard input responses and analyse error and differentiate various types of control systems and time domain specifications.
MEC501.6	The students will be able to analyse the problems associated with stability using different techniques.

**MEC502/MEL501 – Thermal Engineering**

MEC502.1	The student will be able to analyze the three modes of heat transfer in engineering applications and analyze the steady state heat transfer in engineering applications.
MEC502.2	The student will be able to identify and analyze the heat transfer through different type of finned surfaces and Transient heat Transfer in engineering applications.
MEC502.3	The students will be able to classify various types of static characteristics and types of errors occurring in the system.
MEC502.4	The students will be able to classify and select proper measuring instrument for displacement, pressure, flow and temperature measurements.
MEC502.5	The students will be able to design mathematical model of system/process for standard input responses and analyse error and differentiate various types of control systems and time domain specifications.
MEC502.6	The students will be able to analyse the problems associated with stability using different techniques.

**MEC503/MEL502 – Dynamics of Machinery**

MEC503.1	The students will be able to explain the working principle of different Governors and effect of Gyroscopic couple on various moving objects.
MEC503.2	The students will be able to discuss Static and Dynamic Force Analysis and Dynamically Equivalent System.
MEC503.3	The students will be able to calculate the natural frequency free undamped and damped single degree of freedom system.
MEC503.4	The students will be able to modify a single degree of freedom vibration system with multiple masses, springs and dampers into an Equivalent single degree of freedom vibration system.
MEC503.5	The students will be able to analyze Forced Vibration System, Vibration Isolation, Vibration Transmissibility and Vibration Measuring Instruments.
MEC503.6	The students will be able to determine the critical speeds of a Rotor-Shaft system and magnitude and orientation of the balancing masses in case of multiple rotor and reciprocating systems.

**MEC504/MEL503 – Finite Element Analysis**

MEC504.1	The students will be able to solve differential equations using weighted residual methods.
MEC504.2	The students will be able to develop the finite element equations to model engineering problems governed by second order differential equations.
MEC504.3	The students will be able to apply the basic finite element formulation techniques to solve engineering problems by using one dimensional element.
MEC504.4	The students will be able to apply the basic finite element formulation techniques to solve engineering problems by using two dimensional elements.
MEC504.5	The students will be able to apply the vector variable techniques to solve engineering problems by using two dimensional elements.
MEC504.6	The students will be able to apply the basic finite element formulation techniques to find natural frequency of single degree of vibration system.

**MEDLO5012 – Statistical Techniques**

MEDLO5012.1	The students will be able to apply the concept of statistical distribution in engineering application.
MEDLO5012.2	The students will be able to apply sampling theory with given data set.
MEDLO5012.3	The students will be able to fit curves in a given data set.
MEDLO5012.4	The students will be understanding the correlation and regression from statistical method.
MEDLO5012.5	The students will be able to perform the ANOVA from the given data set.
MEDLO5012.6	The students will be able to apply the statistical method from Hypothesis testing and statistical theory.

**MEDLO5013 – Computational Methods**

MEDLO5013.1	The students will be able to classify errors, understand when to stop an iteration in a computational method and express the numbers in binary system.
MEDLO5013.2	The students will be able to identify an appropriate mathematical formulation to solve linear algebraic equations.
MEDLO5013.3	The students will be able to perform basic operations with complex numbers in both rectangular and polar forms to find solution of nonlinear algebraic equations.
MEDLO5013.4	The students will be able to formulate and use parametric and closed form representations of curves and surfaces in engineering / mathematical problem.
MEDLO5013.5	The students will be able to identify, formulate and solve engineering/mathematical problems involving line, surface, double and triple integrals
MEDLO5013.6	The students will be able to develop mathematical models of physical system in realistic applications like static and dynamic structural analysis, steady state and transient heat transfer problems etc.