Module 3 - Newton's Approach

ME3050 - Dynamics Modeling and Controls

Mechanical Engineering

Tennessee Technological University

Topic 1 - Newton's Laws of Motion

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- Brief Biography
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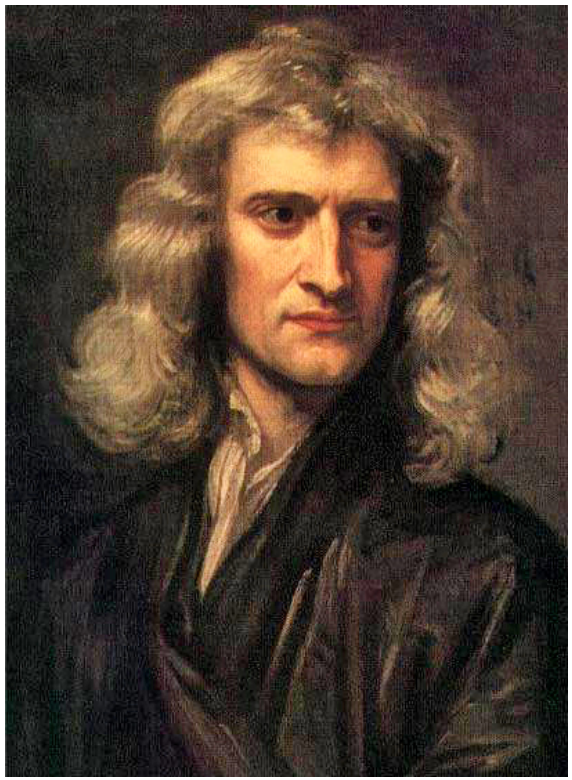

Brief Biography

Early Life:

Isaac Newton was born (according to the Julian calendar, in use in England at the time) on Christmas Day, 25 December 1642 ...

... at Woolsthorpe Manor in Woolsthorpe-by-Colsterworth, a hamlet in the county of Lincolnshire.

Text: Wikipedia

Brief Biography

Education:

From the age of about twelve until he was seventeen, Newton was educated at The King's School, Grantham, which taught Latin and Greek and probably _____

In June 1661, he was admitted to Trinity College, Cambridge ...

... the college's teachings were based on those of Aristotle, whom Newton supplemented with modern philosophers such as Descartes, and astronomers such as Galileo and Thomas Street, through whom he learned of Kepler's work.

Text: Wikipedia

Brief Biography

Development of Calculus:

In 1665, he discovered the generalised binomial theorem and began to develop a mathematical theory that later became calculus. Soon after Newton had obtained his BA degree in August 1665, the university temporarily closed as a precaution against the Great Plague. Although he had been undistinguished as a Cambridge student,[16] Newton's private studies at his home in Woolsthorpe over the subsequent two years saw the development of his theories on calculus,[17] optics, and the law of gravitation.

Text: Wikipedia

Brief Biography

Foundation of Mechanics:

The Principia was published on 5 July 1687 ... In this work, Newton stated _____. Together, these laws describe the relationship between any object, the forces acting upon it and the resulting motion, laying the foundation for classical mechanics. They contributed to many advances during the Industrial Revolution which soon followed and were not improved upon for more than 200 years. Many of these advancements continue to be the underpinnings of non-relativistic technologies in the modern world...

Text: Wikipedia

First Law

Newton's First Law of Motion

Every object persists in its state of rest or uniform motion in a straight line unless it is compelled to change that state by forces impressed on it.

Text: NASA

Second Law

Newton's Second Law of Motion

Force is equal to the change in momentum (mV) per change in time. For a constant mass, force equals mass time acceleration ($F = ma$).

Text: NASA

Third Law

Newton's Third Law of Motion

For every action, there is an equal and opposite re-action.

Text: NASA