| Module Code | MA0010 | Title | History and Philosophy of Mathematics | | | |
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| Credits | None | Hours/ Week | **Lectures** | **01** | Prerequisites | None |
| | | | **Lab/Tutorial** | **01** | | |

**Learning Objectives**
- Creating an awareness and enthusiasm in Mathematics
- Directing them for active, deeper and further learning in Mathematics.

**Learning Outcomes**
- Understand the basic concepts of Mathematics and Statistics.
- Understand the practical aspects of Mathematics and Statistics for Engineering applications.
- Acquire knowledge and current developments in Mathematics.

**Outline Syllabus**
Lectures

**Geometry**
Geometry in Different Cultures**:** Egyptian, Greek, Hindu, Arabic, Sri Lankan; Euclid, Axioms of Euclidian; Classical Geometry: Triangle: Euler Line, Nine Point Circle, Pythagoras, Pythagoras's Theorem: Different Proofs, 3D Version of Pythagoras's Theorem; Polygons, Tessellations, Ruler and Compass Constructions, Trisecting an Angle, Gauss, Coordinate Geometry**:** Cartesian and Polar Coordinates; Circle, Ellipse, Hyperbola, Parabola, Spiral, Cycloid, Epicycloid, Hypocycloid, Rosette, Lissajous Diagrams, Sphere, Ellipsoid, Hyperboloid, Paraboloid, Torus, Plato, Platonic Solids, Archimedes, Archimedean Polyhedra, Deltahedra, Orbital of Planets, Emergence of Calculus, Newton, Bolzano, Fifth Postulate, Non-Euclidian Geometries, Hyperbolic Geometry. Unsolved Problems in Geometry: Pentagonal Tessellations, Four Colour Conjecture.

**Number Theory**
Numbers in Different Cultures: Egyptian, Greek, Hindu, Arabic, Sri Lankan; Arithmetica, Zero and Infinity, Number Bases, Fibonacci Sequence, Golden Ratio, Continued Fractions, Ramanujan, Rational and Irrational Numbers, Buffoon's Needle, Non-countability of Irrational Numbers, Divisibility Theory, Congruencies, Euclidean Algorithm, Diophantine Equations, Fermat, Fermat's Last Theorem, Andrew Wiles, Prime Numbers, Eratosthenes's Sieve, Fundamental Theorem of Arithmetic, Number of Primes, Prime Number Theorem, Mersenne and Fermat's Numbers, Twin Primes, Perfect Numbers, Unsolved Problems in Number Theory: Goldbach Conjecture, Twin Prime Conjecture, $3x+1$ Problem.

**Descriptive Statistics**
Data types, Data Collection and Validation, Data Entry, Data Representation, Statistical indicators. Data Transformation

**Present and Future of Mathematics**
Main Branches of Pure Mathematics and Applied Mathematics, Philosophy and Mathematical Basis of Engineering Science, Mathematical Courses Conducted Inside and Outside the Country, Opportunities in Mathematics Research for Engineers, Organizations and Publications Devoted to Mathematics,.

Practicals
- Left-Right asymmetry in nature.
- Fibonacci Sequence, Golden Ratio.
- Ruler and compass constructions, Polyhedra.
- Buffon's Needle.
- Prime Number Generation.
- Use of CASIO calculators and EXEL for mathematical and statistical calculations.
- Drawing of Geometrical Fugues Manually and using MATLAB.
- Introduction, pros and cons in general mathematical packages such as MATLAB and MATHEMATICA