Course Title: Engineering Mathematics (1)   Course Code EMP101
Credit Hours: 3   Contact Hours: 4   Lecture 2   Tutorials 2
Prerequisite(s) -
Course Description
Differentiation and Integration: Functions – Limits –Differentiation -indefinite integrals - Integral properties. Linear Algebra: Binomial Theorem-Partial Fraction-Complex Numbers- Linear Equations-Matrices-Matrix properties.

Course Title: Engineering Mathematics (2)   Course Code EMP102
Credit Hours: 3   Contact Hours: 4   Lecture 2   Tutorials 2
Prerequisite(s) EMP101
Course Description
Integration: Different methods for integration by substitution-partial -Fraction-Recurrent Reduction-Riemann Series-Applications for calculating Surfaces and Volumes. Analytical Geometry: Second Order equations- Pairs of straight Lines-Circle and group of Circles-Conic Sections-Coordinate Systems-Plane Equation-Sphere Cylinder and Cone.

Course: Title Engineering Mathematics (3)   Course Code EMP201
Credit Hours: 3   Contact Hours: 4   Lecture 2   Tutorials 2
Prerequisite(s) EMP102
Course Description
Periodic Functions-Implicit and Logarithmic Differentiation and for Parametric Equations Vector Algebra-Euler and Demoivre formulas-Inverse trigonometric functions-introduction to Mat Lab in solving mathematical problems.

Course Title: Engineering Mathematics (4)   Course Code EMP202
Credit Hours: 3   Contact Hours: 4   Lecture 2   Tutorials 2
Prerequisite(s) EMP201
Course Description
Differential Equations-Laplace Transform- Fourier Series and Transform-Numerical Analysis- Mat Lab-Introduction to Statistics and Probability Theorems-Software Applications: Excel-SPSS.

Course Title: Engineering Mathematics (5)-Control   Course code EEC314

Credit hours: 3   Contact Hours: 4   Lectures 2   Tutorials 2

Prerequisites EMP202

Topics

Vector Algebra, Dot and cross product and their applications, Partial Differentiation and Derivatives of vector functions. Gradient/ Divergence/ curl / Laplacian. Line integrals, line integrals independent of the path, exactness. Conservative vector fields. Double integrals in Cartesian and polar coordinates, Green's theorem, surface integrals,

Stokes' theorem, triple integrals, Divergence (Gauss' Theorem). Line complex integrals / Cauchy's integrals theorem, Zeros and poles of analytic functions, residues and their evaluation. Residue theorem, applications to real integral.

Course Title: Engineering Mathematics (6)-Control   Course code EEC325

Credit hours: 3   Contact Hours: 4   Lectures 2   Tutorials 2

Prerequisites EMP202

Topics

Statistics, some basic definitions, Conditional probability. Bayes theorem and total probability. Independent and dependent events. Discrete probability distribution, Continuous probability distribution. Mathematical expectation, Numerical methods: Finding roots using bisection method, Newton's method, Solution of linear system of equations using Gauess method and matrix decomposition, Solution of partial D.E. (Heat and Wave equations), Lagrange and Newton Interpolation methods.

Course Title: Engineering Mathematics (5)-Communication   Course Code EMP301

Credit Hours: 3   Contact Hours: 4   Lecture 2   Tutorials 2

Prerequisite(s) EMP202

Topics

Introduction to Statistics and Data Analysis, Treatment of Data, Probability, Probability Distributions, Probability Densities, Sampling Distributions, Inferences Concerning Means, Inferences Concerning Variances, Inferences Concerning Proportions, Nonparametric Tests, Curve Fitting, Analysis of Variance, Simple Linear Regression and Correlation, Multiple Linear Regression and Certain Nonlinear Regression Models, Quality Control.

Course Title: Engineering Mathematics (6)-Communications   Course Code EMP302

Credit Hours: 3   Contact Hours: 4   Lecture 2   Tutorials 2

Prerequisite(s) EMP202

Topics

Laplace transform, The Laplace transform of a periodic function, Heaviside's expansion theorem, Convolutions, Integral equations, Transfer functions, Green's function and Indical admittance, The Z transform, Inverse Z transform, Solution of difference equations, Stability of discrete-time systems, The strum-Liouville problem, Eigenvalues and Eignfunctions, Orthognality of eigenfunctions, Expansion in series of eigenfunctions, Legendre's equation, Bessel's equation, The wave equations, The vibrating string, Cauchy problem, Separation of variables, D'Alembert's Formula, Numerical solution of the wave equation. Laplace's equation, Boundary conditions, Numerical solution of Laplace's equation. Linear algebra, Cramer's rule, Row Echelon form and Gaussian elimination, Eigenvalues and eigenvectors, Systems of linear differential equations.