| 22MYB07- PROBABILITY AND COMPLEX FUNCTIONS<br>*(For EEE Branch only)* | | | | |
|---|---|---|---|---|
| | **L** | **T** | **P** | **C** |
| | **3** | **1** | **0** | **4** |

**PRE-REQUISITE: NIL**

| | |
|---|---|
| **Course Objective:** | • Develop probability distribution of discrete and continuous random variables, Joint probability distribution occurs in digital signal processing, design engineering and microwave engineering<br>• Provide adequate knowledge in Complex Analysis and Special functions familiarize the Power series solution required to analyze the Engineering Problems. |

| **Course Outcomes**<br>The Student will be able to | | **Cognitive Level** | **Weightage of COs in End Semester Examination** |
|---|---|---|---|
| CO1 | Analyze the concepts of the probability and random variable, joint distribution functions in the area of communication engineering. | An | 40% |
| CO2 | Obtain the concepts of analytic function and conformal mapping in electrical circuits. | An | 20% |
| CO3 | Apply complex integration techniques and contour integration techniques in circuit theory problems. | Ap | 20% |
| CO4 | Solve the new techniques for differential equations in electrical theory problems. | Ap | 20% |
| CO5 | Demonstrate the importance of complex variables, and differential equations using programming tools in Control systems. | Ap | Internal Assessment |

| **UNIT I - PROBABILITY AND RANDOM VARIABLES** | **(9+3)** |
|---|---|
| Axioms of probability – Conditional probability – Baye's theorem - Discrete and continuous randomvariables–Moments–Momentgeneratingfunctions–Binomial,Poisson, Uniform and Normal distributions. | |
| **UNIT II -TWO-DIMENSIONAL RANDOM VARIABLES** | **(9+3)** |
| Joint distributions – Marginal and conditional distributions – Covariance – Correlation and linear regression–Transformation of random variables–Central limit theorem (Excluding proof). | |

| UNIT III- ANALYTIC FUNCTIONS | (9+3) |
|---|---|
| Analytic functions–Necessary and sufficient conditions for analyticity in Cartesian and polar coordinates-Properties–Harmonic conjugates–Construction of analytic function–Conformal mapping – Mapping by functions w = z+c, cz, c/z, Bilinear transformation. | |
| **UNIT IV - COMPLEX INTEGRATION** | **(9+3)** |
| Line integral-Cauchy's integral theorem–Cauchy's integral formula–Taylor's and Laurent's series–Singularities–Residues–Residue theorem–Application of residue theorem for evaluation of real integrals-Evaluation of contour integration over unit circle and semi circle | |
| **UNIT V - ORDINARYDIFFERENTIALEQUATIONS** | **(9+3)** |
| Higher order linear differential equations with constant coefficients-Method of variation of parameters–Homogenous equation of Euler's and Legendre's type–System of simultaneous linear first order differential equations with constant coefficients. | |
| **TOTAL (L:45+ T:15) : 60 PERIODS** | |

**TEXT BOOKS:**


1. Milton.J.S. and Arnold.J.C., "Introduction to Probability and Statistics", Tata McGraw Hill,4th Edition, 2007.
2. Johnson.R.A., Miller.I and Freund.J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 9th Edition, 2016.
3. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, NewDelhi,44thEdition, 2018.


**REFERENCES:**


1. Papoulis. A. and Unnikrishna pillai.S., "Probability, Random Variables and Stochastic Processes", McGraw Hill Education India, 4thEdition, New Delhi, 2010.
2. Ross.S.M., "Introduction to Probability and Statistics for Engineers and Scientists", 5th Edition, Elsevier,2014.
3. Kreyszig.E, "Advanced Engineering Mathematics", JohnWiley and Sons,10th Edition, NewDelhi, 2016.


**Mapping of COs with POs / PSOs**

| | POs | | | | | | | | | | | | PSOs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **COs** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **1** | **2** |
| **1** | 3 | | | | | | | | | | | | | |
| **2** | | 2 | | | | | | | | | | | | |
| **3** | | 2 | | | | | | | | | | | | |
| **4** | 3 | | | | | | | | | | | | | |
| **5** | 3 | | | | 2 | | | | 3 | | | 2 | | |
| **CO (W.A)** | **3** | **2** | | | **2** | | | | **3** | | | **2** | | |