BLOW UP SYLLABUS

Complex Analysis, Probability and Statistical Methods (18MAT41)

(Common to all Programmes)

(Effective from the academic year 2019-20)

Topics	Topics To be Covered	Hours
MODULE - I		
CALCULUS OF COMPLEX FUNCTIONS & CONSTRUCTION OF ANALYTIC FUNCTIONS		
1. Review of a function of a complex variable, limits, continuity, differentiability**.**	Discussion restricted to the Articles No. 20.1, 20.2, and 20.3(1) of Text Book 2.	**1L**
2. Analytic functions: Cauchy-Riemann equations in Cartesian and polar forms. Properties and construction of analytic functions and problems.	Discussion restricted to problems as suggested in Article No.20.3(2), 20.4 & 20.5(1, 2) of Text Book 2.	**4L**
3. Construction of analytic functions: Milne-Thompson method-Problems.	Discussion restricted to problems as suggested in Article No. 20.6(page No. 679) of Text Book 2.	**2L**
Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1 & L2)	**Total**	**09**
MODULE - II		
CONFORMAL TRANSFORMATIONS AND COMPLEX INTEGRATION		
1. Conformal transformations: Introduction. Discussion of transformations: $w=z^2$, $w=e^z$, $w=z+\frac{1}{z},(z\neq 0)$. Bilinear transformations- Problems	Discussion restricted to problems on Article No.20.8(4), 20.9(1) & 20.10(1,2,3) of Text Book 2.	**4L**
2. Line integral of a complex function-Cauchy's theorem and Cauchy's integral formula and problems.	Discussion restricted to problems on Article No. 20.12, 20.13 & 20.14 of Text Book 2.	**3L**
Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1 & L2)	**Total**	**09**
MODULE - III		
PROBABILITY DISTRIBUTIONS		
1 Random variables (discrete and continuous), probability mass/density functions	Discussion restricted to Problems on Article No.26.7, 26.8, 26.9 & 26.10(1, 2) of Text Book 2.	**3L**
2. Binomial, Poisson distributions-problems	Discussion restricted to Problems on Article No. 26.13, 26.14(1, 3, 4) & 26.15(1, 3) of Text Book 2.	**2L**

3. Exponential and Normal distributions-problems	Discussion restricted to Problems on Article No.26.16(1, 2-(IV), 4) & 26.19(6) of Text Book 2.	**2L**
Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1,L2 & L3)	**Total**	**09**
MODULE - IV		
CURVE FITTING & STATISTICAL METHODS		
1. Curve fitting by the method of least squares- fitting the curves of the form- $y = ax + b, y = ax^b$ & $y = ax^2 + bx + c.$	Discussion restricted to Problems on Article No.24.1, 24.5(1, 2(a, b)) & 24.6(1) of Text Book 2.	**2L**
2. Correlation-Karl Pearson's coefficient of correlation and rank correlation(without repetition) –problems. Regression analysis-lines of regression –problems	Discussion restricted to Problems on Article No.25.12, 25.13(a, b), 25.14 & 25.16 of Text Book 2.	**5L**
Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L1,L2 & L3)	**Total**	**09**
MODULE - V		
JOINT PROBABILITY DISTRIBUTION AND SAMPLING THEORY		
1. Joint Probability distribution for two discrete random variables, expectation and covariance.	Discussion restricted to problems on Article No.23.16(2) of Text book 3	**3L**
2. Introduction to sampling distributions, standard error, Type-I and Type-II errors.	Discussion restricted to Problems on Article No.27.1, 27.2 & 27.3(1, 2) of Text Book 2.	**2L**
3. Hypothesis testing of a sampling distribution for single mean, student's **t**-distribution, Chi-square distribution as a test of goodness of fit.	Discussion restricted to Problems on Article No.27.3(3), 27.7, 27.13, 27.14(1), 27.15 & 27.18 of Text Book 2.	**2L**
Tutorials	Involvement of faculty and students in identifying the solutions to the problems; PPT presentations of Engg. Applications by the faculty, about the module.	**2T**
(RBT Levels: L2, L3 & L4)	**Total**	**09**

Text books:

1. **E. Kreyszig**: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed.(Reprint), 2017.
2. **B.S. Grewal**: Higher Engineering Mathematics, Khanna Publishers, 44th Ed., 2017.
3. **Srimanta Pal & Subobh C Bhunia:** "Engineering Mathematics", Oxford University Press, 3rd Reprint, 2016.

Reference Books:

1. **C.Ray Wylie, Louis C.Barrett** : "Advanced Engineering Mathematics", 6th Edition, 2. McGraw-Hill Book Co., New York, 1995.
2. **S.S.Sastry:** "Introductory Methods of Numerical Analysis", 4th Edition, PHI, 2010.
3. **B.V.Ramana**: "Higher Engineering Mathematics" 11th Edition, Tata McGraw-Hill, 2010.
4. **N.P.Bali and Manish Goyal**, **"**A Text Book of Engineering Mathematics**"**, Laxmi Publications. Latest edition, 2014.
5. **Chandrika Prasad and Reena Garg** ,"Advanced Engineering Mathematics", Khanna Publishing,2018.