

Course Code :		1BMAC301C	MATHEMATICS FOR CIVIL ENGINEERING STREAM	Semester :	III
L:T:P :		3:0:0		Course Type :	BSC
Hours/Sem.	Teaching :	42 Hrs		CIE Marks :	50
	Learning (TW+SL) :	42 Hrs		SEE Marks :	50
	Exam :	06 Hrs		Total Marks :	100
	Total Hrs. :	90 Hrs		Credits :	03

Professional Competency:

Apply complex analysis, statistics and probability distributions to solve engineering problems.

Course Outcomes:

After completion of the course, student will be able to

CO1: Determine the analyticity of complex functions using the principles of complex differentiability and Cauchy–Riemann equations.

CO2: To evaluate complex integrals by using the principles of Cauchy's integral theorem and residue theorem.

CO3: Apply correlation and regression analysis to fit appropriate mathematical models to statistical data.

CO4: Employ the basic concepts of probability and probability distribution.

UNIT-I

11 Hrs

Complex Variables: Analytic function, Cauchy-Riemann equations in Cartesian and polar forms. Construction of analytic function (Cartesian and polar forms), Bilinear transformations. Conformal mapping ($e^z, z^2, z + \frac{1}{z}$)

UNIT-II

10Hrs

Complex Integration: Line integral, Cauchy's theorem – corollaries (without proof), Cauchy's integral formula. Taylor's and Laurent's series (statements only), singularities, poles, calculation of residues, Cauchy's residue theorem (without proof) - problems.

UNIT-III

10 Hrs

Curve fitting, Correlation and Regressions: Principles of least squares, Curve fitting by the method of least squares in the form $y = a + bx$, $y = a + bx + cx^2$, and $y = ab^x$. Correlation, Regression and Rank correlation.

UNIT-IV

11 Hrs

Probability Distributions: Review of basic probability theory. Random variables (discrete and continuous), probability mass and density functions. Mathematical expectation, mean and variance. Binomial, Poisson and Normal distributions- problems (derivations for mean and standard deviation for Binomial and Poisson distributions only)-Illustrative examples.

Text Books:

1. **Ronald E. Walpole, Raymond H Myers, Sharon L Myers & Keying Ye** "Probability & Statistics for Engineers & Scientists", Pearson Education, 9th edition, 2017.
2. **Peter Bruce, Andrew Bruce & Peter Gedeck** "Practical Statistics for Data Scientists" O' Reilly Media, Inc., 2nd edition 2020.

Reference Books:

1. **Erwin Kreyszig**, "Advanced Engineering Mathematics", John Wiley & Sons, 9th Edition, 2006.
2. **B. S. Grewal** "Higher Engineering Mathematics", Khanna publishers, 44th Ed., 2021.
3. **G Haribaskaran** "Probability, Queuing Theory & Reliability Engineering", Laxmi Publication, Latest Edition, 2006

4. **Irwin Miller & Marylees Miller**, John E. Freund's "Mathematical Statistics with Applications" Pearson. Dorling Kindersley Pvt. Ltd. India, 8th edition, 2014.
5. **S C Gupta and V K Kapoor** , "Fundamentals of Mathematical Statistics", S Chand and Company , Latest edition.
6. **Robert V. Hogg, Joseph W. McKean & Allen T. Craig**. "Introduction to Mathematical Statistics", Pearson Education 7thedition, 2013.
7. **Jim Pitman**. Probability, Springer-Verlag , 1993.
8. **Sheldon M. Ross**, "Introduction to Probability Models" 11th edition. Elsevier, 2014.

Table: Matrix to describe the mapping of COs with POs (considering WKs) and PSOs

Course Outcomes (COs)	Program Outcomes and (WKs)											Program Specific Outcomes (PSOs)	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO1	3 (WK1, WK2, WK3, and WK4)	2 (WK1, WK2 and WK3)						1			1		
CO2	3 (WK1, WK2, WK3 and WK4)	2 (WK1, WK2 and WK3)						1			1		
CO3	3 (WK1, WK2, WK3 and WK4)	2 (WK1, WK2 and WK3)						1			1		
CO4	3 (WK1, WK2, WK3 and WK4)	2 (WK1, WK2 and WK3)						1			1		

Sri B.V.V.S.
Basaveshwar Engineering College, Bagalkote
Scheme (from 2026-27)

Sl. N o.	Cour se Code	Course Title	Teaching-Learning Scheme				Examinati on Duration (Hrs/Sem.)		Tot al Hou rs	Examination Scheme and Evaluation			Credi ts (C)= Total Hour s/30
			L Hrs/ Wee k (Hrs/ Sem.)	T Hrs/ Wee k (Hrs/ Sem.)	P Hrs/ Wee k (Hrs/ Sem.)	Term Work (TW) and Self Learning (SL) (TW+SL) Hrs/Sem.	CIE	SEE		CIE Mar ks	SEE Mar ks	Total Mark s	
1	1BM AC30 1C	Mathe matics for Civil Engine ering Stream	3(42)	0	0	42	3	3	90	50	50	100	3= 90/3 0