VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State
DEPARTMENT OF MATHEMATICS

COMPLEX VARIABLES
(OPEN ELECTIVE-I for CSE,CSE-AIML & IT of 2/4 B.E III-Sem)

L:T:P (Hrs./week):2:0:0	SEE Marks :60	Course Code: **U220E320MA**
Credits : 2	CIE Marks: 40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to :	*At the end of the course students should be able to:*
1. **Understand** the Analytic functions, conditions and harmonic functions.	1. **Apply** the condition(s) for a complex variable function to be analytic and/or harmonic and to construct an Analytic function.
2. **Evaluate** the line integral of a function of a complex variable using Cauchy's integral formula, and how to	2. **Evaluate** the complex integrals by Cauchy's theorem and Cauchy's Integral formula.
3. **Understand** the concept of Taylor's and Laurent Series.	3. **Identify** the singularities of a function and to expand a given function as a Taylor's / Laurent's series.
4. **Understand** the Cauchy's residue theorem.	4. **Evaluate**the complex integrals by Cauchy's Residue theorem

UNIT – I(8 classes)
DIFFERENTIATION OF COMPLEX FUNCTION

Introduction to complex function-Limits and Continuity of function - Differentiability and Analyticity - Necessary & Sufficient Condition for a Function to be Analytic(Cartesian) - Milne-Thompson's method -Harmonic Functions.

UNIT – II(6 classes)
INTEGRATION OF COMPLEX FUNCTION

Complex Integration- Cauchy's Theorem(with proof) - Cauchy's Integral Formula(with proof) - Evaluation of integrals by Cauchy's Integral formula.

UNIT – III(6 classes)
SERIES OF COMPLEX FUNCTIONS

Power series - Taylor's Series - Laurent's Series (without proofs) –Zero and singularities of complex function.

UNIT – IV(8 classes)
RESIDUES
Introduction to Residues- Residues at singularities-Cauchy's Residue theorem (without proof) –Evaluation of integrals by Cauchy's Residue theorem.

Learning Resources:

1 Advanced Engineering Mathematics 3rd Edition, R.K.Jain&S.R.K.Iyengar, Narosa Publishing House.
2 Higher Engineering Mathematics 40thEdition Dr. B.S Grewal, Khanna Publishers.
3 A Text book of Engineering Mathematics, N.P.Bali& Manish Goyal, Laxmi Publications.

Online Resources :

1   http://mathworld.wolfram.com/topics
2   http://www.nptel.ac.in/course.php;

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

Prof.N.Kishan
(OU Nominee)

Prof.M.A.Srinivas
(Subject Expert-JNTU-H)

Dr.T.Sudhakar Rao
Chairman, BOS)