

Grams: "TECHNOLOGY"  
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**Directorate of Academics & Planning**  
**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**KAKINADA-533003, Andhra Pradesh, INDIA**

Lr. No. JNTUK/DAP/R16 ECE&EIE/MathsII syllabus/2016

08-09-2016

**Dr. K.Padma Raju**

*B.Tech, M.Tech., Ph.D.*

**Professor of Electronics and Communication Engineering &  
Director, Academics & Planning**

To  
The Principals of all Affiliated Colleges  
JNTUK Kakinada.

Sir,

Sub: JNTUK – DAP – Partial modification in Mathematics-II syllabus pertaining to I B.Tech. I Semester of ECE&EIE branches only - Reg.

All the Principals of Affiliated Colleges, JNTUK are hereby informed to note partial modification in Mathematics-II Syllabus pertaing to I B.Tech. I Semester of ECE&EIE branches only.

Regards.

Director, Academic & Planning

Encl: Mathematics – II syllabus of ECE & EIE branches.

Copy to the Secretary to the Hon'ble Vice- Chancellor  
Copy to the Rector  
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Copy to the CE and ACE's

## MATHEMATICS-II (Numerical Methods and Complex Variables)

(Only for ECE & EIE branches of First Year B.Tech.)

### UNIT I: Solution of Algebraic and Transcendental Equations:

Introduction- Bisection method – Method of false position – Iteration method – Newton-Raphson method (One variable and simultaneous Equations).

### UNIT II: Interpolation:

Introduction- Errors in polynomial interpolation – Finite differences- Forward differences- Backward differences – Central differences – Symbolic relations and separation of symbols - Differences of a polynomial-Newton's formulae for interpolation – Interpolation with unequal intervals - Lagrange's interpolation formula.

### UNIT III: Numerical Integration and solution of Ordinary Differential equations:

Trapezoidal rule- Simpson's  $1/3^{\text{rd}}$  and  $3/8^{\text{th}}$  rule-Solution of ordinary differential equations by Taylor's series- Picard's method of successive approximations-Euler's method - Runge-Kutta method (second and fourth order).

### Unit-IV: Functions of a complex variable

Complex function, Real and Imaginary parts of Complex function, Limit, Continuity and Derivative of complex function, Cauchy-Riemann equations, Analytic function, entire function, singular point, conjugate function,  $C-R$  equations in polar form, Harmonic functions, Milne-Thomson method, Simple applications to flow problems,

### Unit-V: Series Expansion and Complex Integration

Line integral of a complex function, Cauchy's theorem(only statement), Cauchy's Integral Formula. Absolutely convergent and uniformly convergent of series of complex terms, Radius of convergence, Taylor's series, Maclaurin's series expansion, Laurent's series.

### Unit-VI: Singularities and Residue Theorem

Zeros of an analytic function, Singularity, Isolated singularity, Removable singularity, Essential singularity, pole of order  $m$ , simple pole, Residues, Residue theorem, Calculation of residues, Residue at a pole of order  $m$ , Evaluation of real definite integrals: Integration around the unit circle, Integration around semi circle, Indenting the contours having poles on the real axis.

### Text Books:

1. B.S.GREWAL, Higher Engineering Mathematics, 43<sup>rd</sup> Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

### Reference Books:

1. DEAN G. DUFFY, Advanced engineering mathematics with MATLAB, CRC Press
2. V.RAVINDRANATH and P.VIJAYALAKSHMI, Mathematical Methods, Himalaya Publishing House.
3. ERWIN KREYSZIG, Advanced Engineering Mathematics, 10<sup>th</sup> Edition, Wiley-India.
4. DAVID KINCAID, WARD CHENEY, Numerical Analysis-Mathematics of Scientific Computing, 3<sup>rd</sup> Edition, Universities Press.