

# FUTURE VISION BIE

One Stop for All Study Materials  
& Lab Programs



Future Vision

By K B Hemanth Raj

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<b>B. E. Common to all Programmes</b> <b>Outcome Based Education (OBE) and Choice Based Credit System (CBCS)</b> <b>SEMESTER - III</b>			
<b>ADDITIONAL MATHEMATICS – I</b> (Mandatory Learning Course: Common to All Programmes) (A Bridge course for Lateral Entry students under Diploma quota to BE/B. Tech. programmes)			
Course Code	<b>18MATDIP31</b>	CIE Marks	40
Teaching Hours/Week (L:T:P)	(2:2:0)	SEE Marks	60
Credits	<b>0</b>	Exam Hours	03
<b>Course Learning Objectives:</b> <ul style="list-style-type: none"> <li>To provide basic concepts of complex trigonometry, vector algebra, differential and integral calculus.</li> <li>To provide an insight into vector differentiation and first order ODE's.</li> </ul>			
<b>Module-1</b>			
<b>Complex Trigonometry:</b> Complex Numbers: Definitions and properties. Modulus and amplitude of a complex number, Argand's diagram, De-Moivre's theorem (without proof). <b>Vector Algebra:</b> Scalar and vectors. Addition and subtraction and multiplication of vectors- Dot and Cross products, problems.			
<b>Module-2</b>			
<b>Differential Calculus:</b> Review of successive differentiation-illustrative examples. Maclaurin's series expansions-Illustrative examples. Partial Differentiation: Euler's theorem-problems on first order derivatives only. Total derivatives-differentiation of composite functions. Jacobians of order two-Problems.			
<b>Module-3</b>			
<b>Vector Differentiation:</b> Differentiation of vector functions. Velocity and acceleration of a particle moving on a space curve. Scalar and vector point functions. Gradient, Divergence, Curl-simple problems. Solenoidal and irrotational vector fields-Problems.			
<b>Module-4</b>			
<b>Integral Calculus:</b> Review of elementary integral calculus. Reduction formulae for $\sin^n x$ , $\cos^n x$ (with proof) and $\sin^m x \cos^n x$ (without proof) and evaluation of these with standard limits-Examples. Double and triple integrals-Simple examples.			
<b>Module-5</b>			
<b>Ordinary differential equations (ODE's).</b> Introduction-solutions of first order and first-degree differential equations: exact, linear differential equations. Equations reducible to exact and Bernoulli's equation.			
<b>Course Outcomes:</b> At the end of the course the student will be able to: <ul style="list-style-type: none"> <li>CO1: Apply concepts of complex numbers and vector algebra to analyze the problems arising in related area.</li> <li>CO2: Use derivatives and partial derivatives to calculate rate of change of multivariate functions.</li> <li>CO3: Analyze position, velocity and acceleration in two and three dimensions of vector valued functions.</li> <li>CO4: Learn techniques of integration including the evaluation of double and triple integrals.</li> <li>CO5: Identify and solve first order ordinary differential equations.</li> </ul>			
<b>Question paper pattern:</b> <ul style="list-style-type: none"> <li>The question paper will have ten full questions carrying equal marks.</li> <li>Each full question will be for 20 marks.</li> <li>There will be two full questions (with a maximum of four sub- questions) from each module.</li> <li>Each full question will have sub- question covering all the topics under a module.</li> <li>The students will have to answer five full questions, selecting one full question from each module.</li> </ul>			

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbook</b>				
1	Higher Engineering Mathematics	B. S. Grewal	Khanna Publishers	43 <sup>rd</sup> Edition, 2015
<b>Reference Books</b>				
1	Advanced Engineering Mathematics	E. Kreyszig	John Wiley & Sons	10 <sup>th</sup> Edition, 2015
2	Engineering Mathematics	N. P .Bali and Manish Goyal	Laxmi Publishers	7th Edition, 2007
3	Engineering Mathematics Vol. I	Rohit Khurana	Cengage Learning	1 <sup>st</sup> Edition, 2015