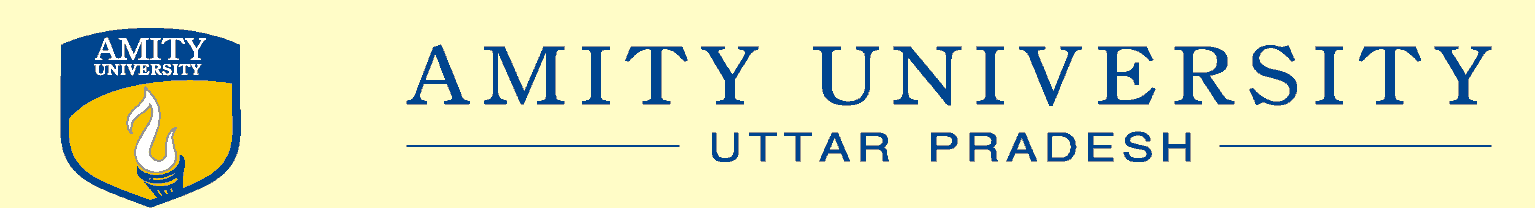
** Annexure ‘CD – 01’**

**FORMAT FOR COURSE CURRICULUM**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **L** | **T** | **P/S** | **SW/FW** | **No. of PSDA** | **TOTAL CREDIT UNITS** |
| 3 | 0 | 0 | 2 | 2 | 4 |

**Course Title: Applied Mathematics-I Credit Units: 4**

**Course Level: UG Course Code: MATH114**

**Course Objectives:**

The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

**Prerequisites:**

Students must have a back ground of Mathematics in senior secondary level.

**Course Contents/Syllabus:**

|  |  |
| --- | --- |
|  | **Weightage (%)** |
| **Module I : Matrix Algebra** | **25%** |
| * Elementary operations, * Reduction of matrices to row echelon form * Rank of matrix, Rank of a matrix by Echelon form and Normal form * System of Linear Equations (Homogeneous and Nonhomogeneous) * Consistency of system linear equations using Rank * Solution of system of linear equations by Gauss Elimination method and Gauss-Jordan method * Eigen values and Eigen vectors of a matrix * Cayley-Hamilton theorem(without proof) * Application of Cayley-Hamilton for finding inverse and power of matrix * Diagonalization of a matrix |
| **Module II : Differential Calculus** | **30%** |
| * Higher order derivatives(,  * Successive Differentiation, Leibnitz’s Theorem(without proof) * Taylor’s series and Maclaurin’s series (Statement only), Expansion of function of one variable by Taylor’s series and Maclaurin’s series * Function with two or more variable, Limit, continuity and Partial differentiation * Euler’s theorem for homogeneous functions * Maxima and Minima of two variable, Method of Lagrange’s multiplier * Taylor’s series and Maclaurin’s series for function with two variable * Jacobian |
| **Module III: Integral calculus** | **20%** |
| * Definite integral: Area of plane region and length of plane curve * Double Integral, change of order of integration * Triple integral * Application to area and volume using double and triple integral |
| **Module IV Vector Calculus** | **25%** |
| * Scalar and vector fields * Gradient, Directional derivative, Divergence, Curl and their properties * Line integral * Green’s theorem in plane (without proof) * Surface integral * Stoke’s theorem (without proof) * Volume Integral * Gauss-Divergence’ theorem (without proof) |

**Course Learning Outcomes:**

At the end of the course, the students will be able to

* Recognize, identify, differentiate and describe the problems like they can classify rows and columns and then to apply different transformations and explain the solutions of system of equations
* Analyze and find partial derivatives, maxima and minima of two variables, Jacobians and expand the functions using Taylor’s series.
* Evaluate and assess the results of various problems in other subjects based on these concepts
* Understand and calculate double, single integrals and can apply knowledge to find area, volume etc.
* Analyze and find the solutions of problems using line integral, surface integral and volume integral and some important theorems of vector calculus.

**Pedagogy for Course Delivery:**

1. The course pedagogy will include Four quadrant approach i.e. video lectures, presentations, e-content, discussions and assessments.

2. All the topics covered in the syllabus will be correlated with its applications in real life situations and also in other disciplines.

3. In order to inculcate problem solving ability in students’ time to time quiz, viva, home assignments and class tests will be conducted during the progress of semester.

4. Video lectures and extra sessions for revision will be undertaken.

**List of Professional Skill Development Activities (PSDA):**

1. **Guest lecture by an expert.**
2. **Group discussion.**

**Lab/ Practicals details, if applicable:**

**List of Experiments:**



**Assessment/ Examination Scheme:**

|  |  |
| --- | --- |
| **Theory L/T (%)** | **Lab/Practical/Studio (%)** |
| **100%** | **NA** |

**Theory Assessment (L&T):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Continuous Assessment/Internal Assessment**  **(\_\_\_\_ %)** | | | | | | | **End Term Examination**  **(\_\_\_%)** |
| **Components (Drop down)** | **MID TERM** | **HOME ASSIGNMENT** | **VIVA VOCE** | **CLASS QUIZ** | **CLASS TEST** | **ATTENDANCE** |  |
| **Linkage of PSDA with Internal Assessment Component, if any** |  |  | **VIVA VOCE** |  |  |  |  |
| **Weightage (%)** | 10 | 10 | 5 | 5 | 5 | 5 | 60 |

**Lab/ Practical/ Studio Assessment:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Continuous Assessment/Internal Assessment**  **(\_\_\_\_ %)** | | | | **End Term Examination**  **(\_\_\_\_ %)** | | |
| **Components (Drop down** |  |  |  |  |  |  |  |
| **Weightage (%)** |  |  |  |  |  |  |  |

**Text Reading:**

* **Advanced Engineering Mathematics by Erwin Kreyszig(9thEdition), Wiley, 2011**
* **Engineering Mathematics by B.S. Grewal,(43rd Edition) Khanna publication, 2014**
* **Higher Engineering Mathematics by B.V. Ramana, McGraw-Hill, 2010**
* **Higher Engineering Mathematics by H.K. Dass,(2nd Edition) S. Chand publication,2011**

**References:**

* **Calculus by Strass, Bradley and Smith( 3rd Edition), Pearson Education, 2007**
* **Elementary Linear Algebra with Applications, Bernard Kolman& David R Hill (9thEdition), Pearson Education, New Jersey,2008**

**Any other Study Material:** e-content and open source reference material available on Amizone

**Mapping Continuous Evaluation components /PSDA with CLOs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Bloom’s Level > | Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |
| Course Learning Outcomes  Assessment type/PSDA | CLO1 | CLO2 | CLO3 | CLO4 | CLO5 | CLO 6 |
| Class Test |  |  |  |  |  |  |
| Home Assignment |  |  |  |  |  |  |
| Class Quiz |  |  |  |  |  |  |
| Viva Voce |  |  |  |  |  |  |