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**Government College University Faisalabad**

**Department: Mathematics Semester: BS CS 1st**

**Name of Teacher: Khadija Bano Course Code: MTH-323**

**Subject Title: Calculus and Analytic Geometry Credit Hours: 3(3-0)**

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| Weeks | **Description of Topics** |
| 1st week | • Introduction of Calculus and Analytic Geometry  • Complex Numbers  • DeMoivre’s Theorem and its Applications |
| 2nd week | • Functions and Graphs  • Simple Cartesian Curves  • Curve Tracing |
| 3rd week | • Limits of functions  • Limits of Bracket function  • Continuity and Continuity of combination of functions |
| 4th week | • Geometrical Interpretation of the Derivative  • Differentiation of Functions  • Derivatives of Trigonometric and Inverse Trigonometric functions |
| 5th week | • Derivatives of Logarithmic and Exponential functions  • Derivatives of Hyperbolic functions  • Derivatives of Inverse Hyperbolic functions |
| 6th week | • Derivative as Slope of Tangent to a Curve and as Rate of Change  • Application to Tangent and Normal  • Partial Derivatives |
| 7th week | • Maxima/Minima and point of Inflexion  • Taylor Expansion and its convergence  • Maclaurin Expansion and its convergence |
| 8th week | **(Mid Term Exam)** |
| 9th week | • Integral as Anti-derivative  • Indefinite Integration of Simple functions  • Application of Integration of Simple functions |
| 10th week | • Methods of Integration  • Integration by Parts  • Application of Integration by Parts |
| 11th week | • Integration by Substitution  • Integration by Partial Fractions  • Application of Integral |
| 12th week | • Definite Integral  • Definite Integral as Limit of a sum  • Application of Definite Integral as Limit of a sum |
| 13th week | • Application of Area  • Linearization  • Arc Length |
| 14th week | • Volume  • Volume and Surface of Revolution  • Application of Volume and Surface of Revolution |
| 15th week | • Assignments  **•**  Presentations  • Presentations |
| 16th week | **(Final Term Examination)** |

**RECOMMENDED BOOKS:**

1. **Thomas, Calculus, 11th Edition. Addison Wesley publishing company, 2005.**
2. **Calculus and Analytical Geometry, Swokowski Olinick. Pence. 1994. 6th edition. Brooks/Cole Publishers.**
3. **Calculus with Analytic Geometry, S.M. Yusuf and Muhammad Amin. 2003. 7th edition.**
4. **Calculus and Analytical Geometry 10th edition. Thomas, F. John Wiley and Sons.**
5. **Calculus, 7th edition. 2002. John Wiley and Sons (WIE).**

**Signature of Teacher: Signature of Head of Department:**