ان المفردات المدرجة أدناه هي ما تم العمل بها من العام الدراسي ٢٠١٤-٢٠١٥م

Syllabus of **CALCULUS**

BSc. Students: First Year

Semester: First

1. **Limits and Continuity**
   - 1.1 Calculating limits by Using Limits Rules.
   - 1.2 Calculating limits by Creating and Canceling a Common Factor.
   - 1.3 Calculating limits by using The Sandwich Theorem.
   - 1.4 One-sided and Two-sided limits
   - 1.5 Calculating limits at Infinity of Rational Functions
   - 1.6 Limits of a Graph and its Asymptotes: vertical, horizontal and Oblique Asymptotes.
   - 1.7 Finding Trigonometric Limits
   - 1.8 Limits of Indeterminate Forms by Using L'Hopital Rule.
   - 1.9 Continuity

2. **Differentiation**
   - 2.1 The Derivative as a Function (calculating the derivative by using the definition.
   - 2.2 Differentiation Rules.
   - 2.3 Derivatives of Trigonometric Functions
   - 2.4 Second- and High Order Derivatives
   - 2.5 The Chain Rule.
   - 2.6 Derivatives of Parametric Equations.
   - 2.7 Implicit differentiation.

3. **Transcendental Functions and Differentiation**
   - 3.1 Natural Logarithm (ln x).
   - 3.2 The Exponential Function (e^x).
   - 3.3 The functions of the Forms $Log_a(x)$ and a^x.
   - 3.4 Hyperbolic Functions.
   - 3.5 Inverse Hyperbolic Functions
   - 3.6 Inverse trigonometric Functions

Dr. Ibrahim Abdelmahdi Sadiq
Subject Lecturer
January 2016

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Syllabus of **CALCULUS** BSc. Students: First Year

Semester: Second

1. Definition of Integration

2. Types of Integration (Definite and Indefinite Integrals)

3. Techniques of Integrations: 3.1 the Method of substitution

3.2 Basic Integration Formulas

3.3 Integration by Parts

3.4 Integration of Rational Functions by Partial Fraction

3.5 Trigonometric Integrals

3.6 Trigonometric substitutions

3.7 Hyperbolic Integrals

3.8 Hyperbolic substitutions

3.9 Integration of Irrational Functions

3.10 The substitution Z=tan(x/2)

3.11 Puppus's Theorem of a Surface Area

3.12 Improper Integrals

4. Applications of Definite Integrals:

4.1 The Area under the Curve

4.2 Area between Curves

4.3 Volume of Solids of Revolution

4.3.1 The Disc Method

4.3.2 The Washer Method

4.4 Volumes of Cylindrical Shells

4.5 Length of a Plane Curve

4.6 Areas of Surfaces of Revolution

4.7 Areas of Surfaces of a Parameterized Curves

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