**King Saud University**

**Department of Mathematics**

**Math 106: Integral Calculus**

**Trimester 1: 1444**

**Book**: **Calculus by Swokowski, Olinick, Pence (Sixth Edition)**

**Suggested material covered each week**

**Week1**

**4.1**. Anti-derivatives and indefinite integrals

**4.2**. Change of variables in indefinite integrals

**4.3**. Summation notation and area

**Week2**

**4.4**. The definite integral

**4.5**. Properties of definite integral

**4.6**. The fundamental theorem of calculus

**Week3**

**4.7**. Numerical integration

**6.2** The natural logarithm function

**6.3**. The exponential function

**Week4**

**6.4**. Integration using natural logarithm and exponential function

**6.5**. General exponential function and logarithm function

**6.7**. Inverse trigonometric functions

**Week5**

**6.8**. Hyperbolic and inverse hyperbolic functions

**6.9**. Indeterminate forms and L’Hopital’s rule

**Week6**

**7.1**. Integration by parts

**7.2**. Trigonometric integrals

**7.3**. Trigonometric substitutions

**Week7**

**7.4**. Integrals of rational functions (Partial fractions)

**7.5**. Quadratic expressions and miscellaneous substitutions

**Week8**

**7.7**. Improper integrals

**5.1**. Area between curves

**5.2**. Volume (by disk or washer method)

**Week9**

**5.3**. Volume (by cylindrical shells method)

**5.5**. Arc length and surface of revolution

**9.1**. Parametric equations

**Week10**

**9.2** .Arc length and surface area (for parametric curves)

**9.3**. Polar coordinates

**9.4**. Integrals in polar coordinates

**Midterm**: date to be determined.