



Course No.	Course Title	Theory	Practice	Credit	Prerequisite(s)
Stat 205	Statistical Mathematics	3	-	3	Math 110

### Objectives

1. To refresh the mathematical knowledge of the student for studying Statistics.
2. To enhance the mathematical background of the student.

### Course Description:

1. Quick revision (oriented-to-probability) on: counting techniques including permutations and combinations, matrices, sets, integrals stressing on double and triple integrals, expansions of functions, maxima and minima of functions, partial fractions, and progressions.
2. Difference and differential equations applied to solve difference-differential equations related to branching processes: birth-and-death processes, and epidemic processes.
3. Laplace's transforms applied to solve: difference, ordinary differential, partial differential differential-difference, integral, integro-differential equations.
4. Special functions: gamma, beta, ... functions applied to statistical distribution theory.
5. Expansions of functions oriented to calculating probabilities from probability and moments from moment generating functions.
6. Constrained maxima and minima using Lagrange's multipliers .
7. The principle of mathematical induction.

### Main text books:

Cramer, H., "Mathematical Methods of Statistics", 13<sup>th</sup> Ed. (1999)

### Subsidiary books:

إسماعيل كنجو وإبراهيم الواصل، طرق رياضية للإحصائيين، جامعة الملك سعود (١٤٢٥) هـ